

# POPULAR Computing

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## WEEKLY

4 - 10 April 1985

*It's the best selling weekly*

Vol 4 No 14

## Police swoop on hackers—two arrested

POLICE have arrested two men on charges related to the 'hacking' of British Telecom's Prestel network, late last year.

The charges made under section 1 of the Forgery and Counterfeiting Act 1981 allege that, Stephen Gold, 29, of Sheffield between November 22 and November 25 last year, forged a computer disc recording information from Prestel's Keats and Dickens computers, and that on De-

ember 28, he forged a computer disc for recording information from Prestel's Keats

computer. Also, twenty-one year old technical author Robert Schifreen of Edgware in Middlesex has been charged that between November 2 1984 and February 17 1985, he forged an electronic device for recording information on Prestel's Gateway test computer, and that on December 8, he forged an electronic device on the Vampire facility of the Prestel Kipling computer.

The two were due to appear in Bow magistrates court on April 3rd.

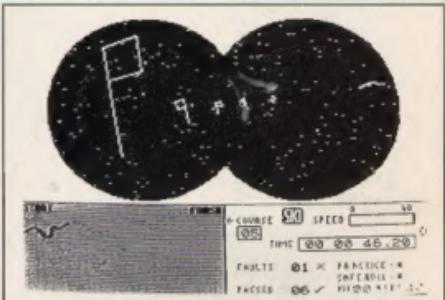
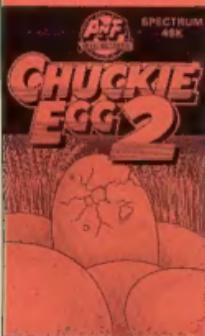
Stephen Gold is the author of Micronet's Micromouse column, which appears daily on the service. However, reports that one of the men is also Hugo Cornwall, pseudonymous author of Century Publications' *The Hackers Handbook*, are almost certainly unfounded.

The arrests come at a time when public interest in hacking had been revived due to controversy surrounding publication of *The Hackers Handbook*.

"We sent a copy of *The Hackers Handbook* to Scotland Yard's fraud squad when it first came out, simply out of interest, so they could see just what and wasn't in it,"

*continued on page 4 ▶*

### Two dozen Choccy Eggs to win for Easter



SKI STAR 2000 is the first title from Richard Shepherd to depart from the adventure format.

It is a skiing simulation, presenting a skier's-eye view to the player. A feature of the game is an option to design your own ski course, driven by a sophisticated icon-driven

menu/plan program. A joystick is used to place obstacles from a graphic menu on a plan-view of the course.

Written by Peter Cooke, whose previous credits include *Urban Upstart*, *Ski Star 2000* will be available from mid-April at £7.95 on the Spectrum.

### Software for Amstrad's 664



AMSTRAD is building up a range of disc software through its software arm Amsoft, ready for the launch of its new disc-based 664 micro in two weeks time.

Sixteen of the 464's best-selling titles have already been converted to the 664's 3

inch disc format, among them *Roland on the Run*, *Harrier Attack*, *Punchy* and *Hunchback*.

Amsoft will also be offering customers an 'up-grade' service, whereby tape versions of programs can be part-exchanged on page 4 ▶

INSIDE ▶ FIRST PUBLISHING PROFILE . . . AMSTRAD STAR GAME ▶

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# View

**T**he arrest of Robert Schifreen and Stephen Gold for supposedly 'hacking' Prestel last November poses the interesting problem of what to do with them.

British Telecom - which found the whole affair and surrounding publicity highly embarrassing - has apparently been investigating for some months. Finally, two individuals have been charged with 'forging computer discs'.

What does that mean? It seems yet another case of the law failing to take account of rapid changes in new technology.

We've been through it all before with the, by now, hugely boring (unless you've been ripped off) question of whether computer software is copyright.

When the hackers' case gets its first hearing this week, and when it eventually comes to court, how will the judges, police, lawyers, barristers and even the media cope? Not very well, I'm afraid.

If it is often difficult for someone in the business to comprehend the issues involved, how is a computer naïf to manage?

One thing is clear, things can't continue as they have done, continually trying to legally redefine each new technology problem in terms of an old technology one. What is needed now is a comprehensive overhaul of the legal system to take account of the issues raised by electronic information, storage, retrieval and communication. More patches won't do.

All will achieve with its present action will be the creation of two new micro 'heroes'.

# POPULAR Computing WEEKLY

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## Futures . . .

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**Editor** David Kelly **News editor** Christina Erskine **Features editor** Graham Taylor **Software editor** John Cook **Production editor** Lynne Constable **Editorial secretary** Geraldine Smyth **Group advertisement manager** David Lake **Advertisement manager** Alastair Macmillan **Assistant advertisement manager** Tom Watson **Advertisement executive** Diane Holyoak **Classified executive** Diane Davis **Advertising production** Linda Lee **Administration** Theresa Lucy **Managing editor** Duncan Scott **Publishing director** Jenny Ireland. **Published by** Sunshine Publications Ltd. 12-13 Little Newport Street, London WC2B 1PP. Tel 01-437 4340 Telex 296275 **Typeset by** Publishers Reprographics Services Ltd. 4 Roger Street, London WC1. **Printed by** Greenway Harrison, Sutton Road, Southend-on-sea, Essex. **Distributed by** E M Distribution, London SW9. Tel 01-274 8811, Telex 281643 @ Sunshine Publications Ltd 1985.

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Computer Trade Association Magazine of the Year

**ABC**

58,052 copies sold every week (Jan-June 1984 ABC).

## CBM admits price problems with C16

COMMODORE has admitted that High Street pricing on the C16 computer may force it to withdraw the machine from the market.

"Commodore cannot support the C16 at the prices it is being sold for in the shops," said a Commodore spokesman.

Most of the larger retailers have been selling the C16 at

around £79 for some time, although W. H. Smith's price is £69.99.

"Commodore was in extended discussions with the retailers for sometime, actively discouraging them from making price cuts, but the High Street is currently extremely nervous about the home computer industry," the spokesman continued.

"While one option could be to drop the machine, there has certainly been no concrete policy taken on dropping either the C16 or the Plus/4, or cutting the price of the 64."

### Ultimate to convert Knight Lore

ULTIMATE will shortly be releasing two new versions of the highly popular *Knight Lore*, for the BBC B and Amstrad CPC464.

Both implementations will contain all the features and top quality animation of the Spectrum version.

*Knight Lore* for the BBC and Amstrad will cost £9.95.

### Amstrad's disc software

◀ continued from page 1  
changed for disc versions of the product.

• Tasman also offers an 'up-grade' to disc service for owners of Tasword 464, Tascopy 464 and Tasprint 464. The last two cost £8.90 on cassette, £12.90 on disc. Tasword 464 costs £19.95 and £22.95, respectively.

said a spokeswoman for Century.



British Telecom is thought to have been investigating attempts to break into the Prestel database very strenuously ever since the now notorious 'hack' into Prince Philip's Prestel mailbox (see *Popular Computing Weekly*, November 8, 1984).

### Medic's QL peripherals delayed

MEDIC Data Systems plans to begin shipping its long awaited QL disc drives and memory expansion boards in the three weeks time.

The company first began accepting orders for its disc system over seven weeks ago at the last February ZX Microfair.

The delay has been due to an oversight in the printed circuit board design.

"Originally we were going to launch two separate

boards, but then we developed a double-sided board," said a Medic spokesman.

However, the edge connectors were designed so that the boards would only fit in upside-down.

"As we have had to get the connectors redone, we are now thinking of making it a multi-layer connector so that things like an IEEE interface can be incorporated. The price for the boards will remain the same."

## Entrepo launches C64 'data drive'

ENTREPO INC, in conjunction with BSR International has now officially launched its new tape-loop C64 storage device, the Quick Data Drive, (see *Popular Computing Weekly*, February 14).

Although based on the same continuous tape loop concept as the Sinclair Microdrive, Entrepo is not keen on making comparisons. "I don't want to knock the Sinclair product," said Ian Turner, vice presi-

dent, "it's just ours is better."

At under £100 the device offers full built-in file management and will load 84K in 30 seconds - compared to 23 minutes for the C2N (without a fastloader) and 2 minutes for 1541 Commodore disc drive.

Bundled with its own operating system, blank wafer cartridge and game (probably Epyx's *Renaissance*), the Quick Data Drive will retail at £99.95 and be available in the shops - including W H Smiths - from early May.

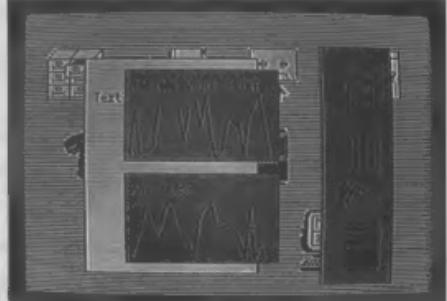
Details from Dean Electronics, Glendale Park, Fernbank Road, Ascot, Berkshire (0344-889261).

## Fourth Protocol game takes shape

HUTCHINSON Computer Publications has announced details of its game based on Frederick Forsyth's best-seller *The Fourth Protocol*.

The game should be launched at the end of May, and takes the form of an icon-driven adventure in three parts. A code word learnt in

second, you travel around London collection more evidence. The third section contains an arcade sequence, as the player, accompanied by a team of SAS troops, must blast through KGB men guarding the atomic bomb. The bomb must then be detonated to complete the game.



the first part enables the player to load the second part, and a second code word is needed to load the third section.

The first section has the player as Forsyth's hero John Preston, in his office trying to uncover evidence concerning a KGB plot to explode a nuclear bomb in Britain. In the

The game has been written and programmed by the Electronic Pencil Company, a team made up mostly of Creative Sparks programmers.

The Fourth Protocol - The Game will be released for the Spectrum, and Commodore 64 at £12.95, and also on disc for the C64 at £15.95.

## Stonechip launches Vixen

STONECHIP Electronics has announced a 16K Ram pack for the C16.

The Vixen 16 plugs into the rear expansion port of the C16, giving the user an extra

16K of programming space.

The Vixen 16 costs £34.95. Details from Stonechip, Unit 9, Brook Trading Estate, Deadbrook Lane, Aldershot, Hants (0252 333362).

## Dragon 200 to be sold in Britain

THE DRAGON 200 - the new computer from the Dragon's Spanish owners Eurohard - was scheduled to make its UK debut at the 6809 Show held last weekend.

The machine is basically a Dragon 64 in a new casing. The only apparent external changes is the addition of an on/off indicator light. The keyboard is identical to the old 64, without the promised rearrangement of the cursor controls.

Also in the pipeline from Eurohard is a new low-cost 2.8 inch floppy disc drive sys-



tem. Unformatted capacity is 144K, 72 per side, giving formatted capacity of 102.4K (51.2 per side).

The floppy disc will also be compatible, according to Eurohard, with other micros.

No price information is available on the Dragon 200 or the Quick Disc at the time of going to press, but Ted Oprychal of Compasense suggests that he will be selling it for around the same price as the Dragon 64 in the UK, hopefully within the next six months.

### New brew from Palace



CAULDRON is the second game from Palace Software, following on from *The Evil Dead* last year.

*Cauldron* is an arcade adventure in which you control a broomstick-riding witch over 200 screens. It will be released for the Spectrum and Commodore 64 in mid-April for £7.99.

## IBM man moves to Commodore

COMMODORE has announced the identity of its new general manager to replace Howard Stanworth, who left the company last month.

The new general manager is 36-year-old Nick Bessey, who moves to Commodore from IBM.

Bessey joined IBM UK as a salesman in 1972. In 1983 he was made Product Manager for IBM's UK dealer channel and retail marketing division.



He will take up his appointment with Commodore UK on April 9th.

## Croucher and Penfold split

MEL Croucher, one half of the duo that headed Automata, has now effectively left the company.



Mel Croucher - a non-executive role only

While Mel is remaining as Automata's company secretary, his partner Christian Penfold has taken over the

day-to-day running.

"I felt it was time for a change," said Mel. "A few other options have come up for me recently. However, Christian will be keeping the philosophy of Automata intact."

Christian said, "Automata is obviously a smaller outfit without Mel, but I hope that we will be bringing out a second Ten Pack of new games in the near future.

"Automata certainly won't be going bankrupt - we never had any money in the first place."

## PREVIEW SOFTWARE CLUB

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 THE HOBBIT Commodore 64  
 PERCY THE POTTY PIGEON Spectrum 48K  
 MEMBERSHIP (Refund voucher enclosed with first order)

	RRP	OUR PRICE	QTY	TOTAL
AMERICAN FOOTBALL Commodore 64, Spectrum 48K and Amstrad	£9.95	£4.95	_____	_____
ALIEN Commodore 64	£9.95	£3.95	_____	_____
BACKPACKERS GUIDE TO THE UNIVERSE Spectrum 48K	£7.95	£2.95	_____	_____
EUREKA Spectrum 48K & Commodore 64	£14.95	£4.95	_____	_____
CAD CAM WARRIOR Commodore 64	£9.95	£4.95	_____	_____
THE HOBBIT Commodore 64	£14.95	£5.95	_____	_____
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PD81

## Wrong message

Oh dear! John Scriven (Ziggurat, March 21 issue) really has got the wrong message about bulletin board systems.

His criticism seems to be based on a few bad experiences. None of the systems I call regularly ever forget my password or have pages to wade through before I can get to the messaging section. Try again, Mr Scriven. Give up now and you'll miss the bus as well as the whole point of bulletin boards.

Boards are a whole new medium - an uncensored, low-cost, public forum where any individual can talk to the world on an equal basis. There are no journalists vs readers, no editors vs advertisers, no politicians vs people, no 'experts' vs punters. Just free people with the chance for speech to a vast audience for the first time ever.

And if the medium is this good, the message will be brilliant. Boards will provide help, advice and contact with others (great for those of us with disabilities or no jobs). You get real political opinion and real reviews as well as hot news.

Sure, it's early days so far, but take a look at the first newspapers and you'll see how things will improve. Most callers are still there for the novelty value but soon they will be the pioneers in one of the most important developments in personal computing.

In contrast, expensive and bureaucratic old Prestel is the last thing we need. 1200/75 baud communication is almost a one-way system - they get to say what they like and you get a huge phone bill trying to answer back. If you don't believe that Prestel is 'controlled' just look at the way Timeframe's pages were removed from the system when the company alleged there was a mole in Prestel's hallowed offices.

The only thing Mr Scriven gets right is that boards are dogged by being single-user. I don't think it will be long before we have multiline or PSS PAD systems and then the fun will start.

Those of us who put our

money where our modems is can rest assured that our time will come. If you're still reading paper magazines or dredging through Prestel, take David Bowman's advice - be warned that something big is about to happen.

Max Phillips  
Manningtree  
Essex

Also on Cabb, BT Gold 84: MTR020 and, yes, Prestel MBX 206391051.

## Enterprise club

A small bunch of Enterprise owners wish to start up an independent users group for the machine, as we feel it deserves more support than it is currently receiving.

I would be grateful to hear from any other users who are in a position to offer assistance, or, simply want to join us as a member. If interested please send an SAE for full details of the club.

Mark Lissak  
organiser  
40 Mansfield Road  
London NW3

## No sympathy

I read with great interest of the plight of OEL in last week's magazine but, after I've related the following story, you'll understand why I feel no sympathy.

I ordered my QCOM modem around Christmas time and in January '88 received a letter quoting a delivery date of 15/2/88. Needless to say this date elapsed with no sign of QCOM and

'phone calls gave the answer that "they're all ready awaiting one chip from TI".

Being a very early QL owner has taught me the virtue of patience if nothing else. Eventually I received an Access statement telling me that OEL had debited my Access account on February 1. (No receipt was ever sent). I have written to them informing them that this act was illegal but have received no reply. Then everything clicked into place when I read last week's *Popular* and found that I, and no doubt lots more people, have been funding OEL's cash-flow crisis.

I have contacted Access and I think I'm covered for such an eventuality but there maybe people out there whose cheques have been cashed who will probably never see the money again.

Please publish the address of the receiver whose name you quoted last week so that he may be contacted by all concerned.

John Lawlor  
35 Stonefield Drive  
Inverurie  
Aberdeenshire  
Scotland

The receiver appointed at OEL is Leslie Ross at Thornton Baker in Liverpool on 051 227 4211.

## Into perspective

Let's get this 'learning a new processor' argument into perspective once and for all.

Surely, it depends on your personal abilities and experience with different processors (if any), and the 'time taken' is only important to those who make their living from these devices.

If you notice, the last two people to write in on this subject have been members of commercial software companies - probably working with computers five, maybe seven days a week. So, for them, two hours or two days may be a reality (although I suspect it would still take several weeks for them to become fully familiar). For the most of us, though, what does it matter how long it takes? After all, I thought home computing was a hobby.

On the subject of 'Atari ST

versus QL'. Surely, the Atari spec alone makes you think twice about buying a QL now, let's wait for the Atari to come out before we criticize or compare. Who knows, they might be doing a 'Sinclair' on us - see you in 1987.

Geoff Sim  
95 Harbours Ave  
Paignton  
Devon

## Universal language

Your columnist in Ziggurat, March 14, asserts that Esperanto does not work.

May I ask him on whose authority he can pronounce this verdict? On the contrary, many people successfully write, talk, discuss and correspond both at home and overseas in Esperanto.

Esperantists welcome criticism, but not condemnation.

A H Gardner  
member Esperanto Centre  
69 Crescent Road  
Wood Green  
London N22

Surely, Frank Marshall, in his article comparing MSX and Esperanto, was not so much saying that it doesn't work - is, that the mechanism for communication was unmanageable - but more that a universal language is only useful if everyone can speak it.

Similarly, unless the majority of micros sold are MSX - which is at present far from being the case - then MSX is not a 'standard', no matter what any company may suggest to the contrary.

## QL baud rate

On the QL I have discovered that if you have your printer set at any baud rate except 9600 you will not be able to do a screen dump from Easel unless you have first set the baud rate by using the Baud command and then using *lrmv mdv1 boot* instead of using the reset and autorun option.

Thank you for supporting the QL. Keep it up.

F Brown  
Coach Lane  
North Shields



"My God! You've breached the fourth protocol!"

# NEW RELEASES



**6.95** 48K SPECTRUM



The game of the film by



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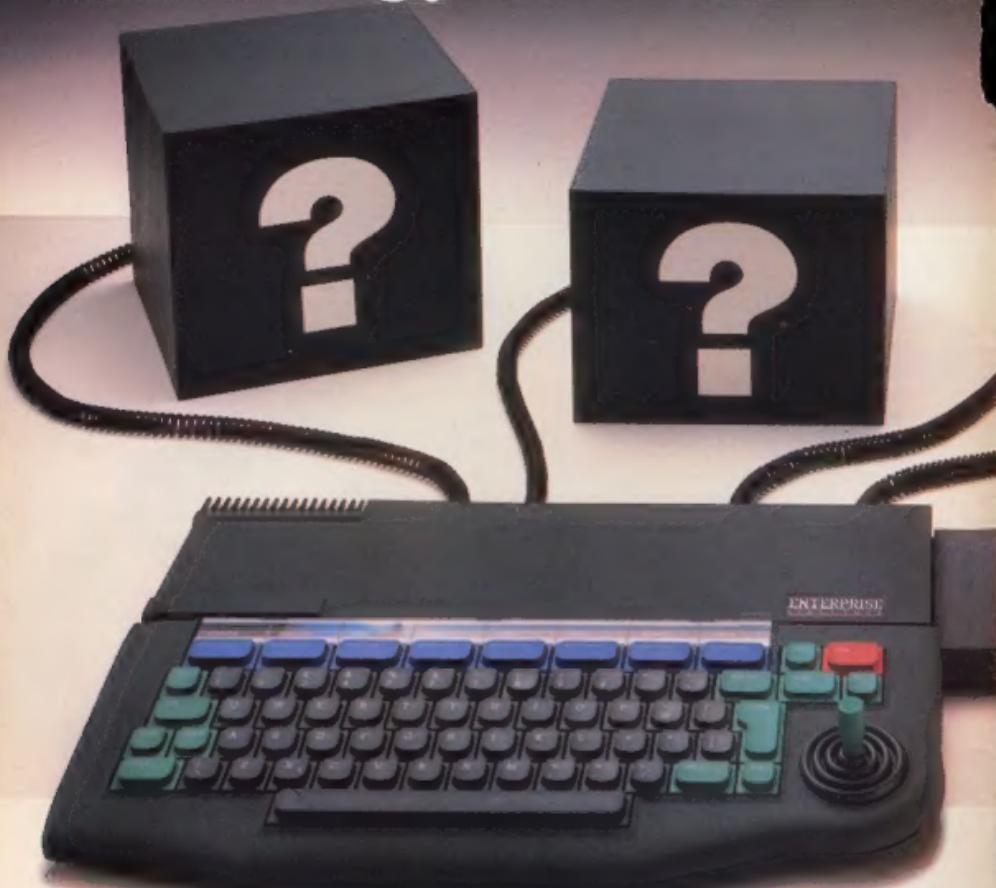


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**Mighty Magus**

# Instead of computers catc technology now has to ca



The way we see it, technology has quite a race on its hands.

There's no other home computer in the world that's so expandable or so updatable as the new Enterprise 64.

And if you're wondering quite how we've managed that, kindly take a closer look at all the outputs on our remarkable new machine.

You'll notice that amongst the usual sockets and terminals we've incorporated a special 66-way expansion port.

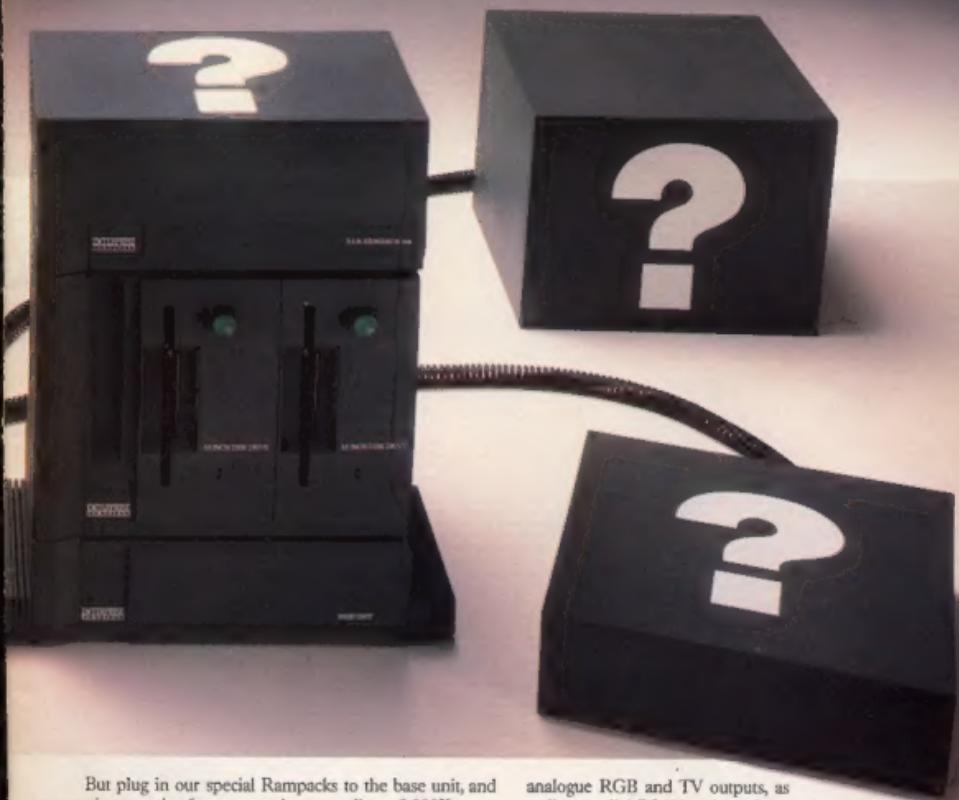
This will accept a whole range of new peripherals that are now in the pipeline.

Including those that are a mere twinkle in the eyes of our hardware designers.

We thought this expandability principle was such a good idea, we applied it to the Enterprise's memory, too.

Even in its most basic 64K form, this puts more user RAM at your disposal than almost any other competitor.

# hing up with technology, tch up with a computer.



But plug in our special Rampacks to the base unit, and you can increase that figure to a truly extraordinary 3,900K.

Not that that's the only challenge we present to today's ambitious programmers.

With a screen resolution of up to 672 x 512 pixels, 256 colours and a high speed video processor, the Enterprise will outrun all but the highest quality TV monitors.

And the sophisticated sound chip generates no fewer than 4 voices across 8 octaves in full stereo.

Combine the two and you can create effects that leave today's games looking like pub video tennis of the mid-70's.

For anyone with literary aspirations, the Enterprise also comes complete with an integrated word processor.

Whilst the really serious user will be delighted to discover

analogue RGB and TV outputs, as well as parallel, RS423 serial and network ports.

Both Cobol and 'C will be available with CP/M running, and you can even use Lisp, Forth and Z80 assembly language on cartridge without encroaching on user RAM.

The new Enterprise 64.

It hasn't just overtaken technology. It's left every other home computer straggling in the distance.

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BY LENNON & McCARTNEY  
"GIVE PEACE A  
CHANCE"  
(CD Number: ST 0001)

DATE: 14 October  
TIME: 0500 Hrs  
PLACE: Europe

### TELETEXT MESSAGE:

MASSIVE US INTERVENTION IN SYRIA.....  
BONN DECLARES DESIRE FOR  
REUNIFICATION OF TWO GERMANY'S.....  
NATO BUILD UP IN WEST GERMANY.....  
RUSSIAN TANKS CROSS WEST GERMAN  
BORDER.....THEATRE EUROPE

#### THEATRE EUROPE - THE GAME

Theatre Europe simulates the first 30 days of the war. In addition to being able to command either side, the player is able to choose the style of his opponent (The Computer). The 1st level is a beginners level, where the computer opponent will not use the nuclear option. If he selects level two, the computer will play a "Rational" game following the accepted strategies of NATO or the Warsaw Pact. In level three it will play a highly unpredictable game.

**Features:**  
Command either NATO or Warsaw Pact forces.  
Three level game option  
Music by Lennon & McCartney (Give peace a chance)\*  
Full colour Map/Poster included  
Fully detailed instruction booklet.

Whilst the producers of Theatre Europe have taken every care in researching this program to ensure the accuracy of details, we must stress that the events depicted in this conflict simulation are entirely fictitious - They must never be allowed to happen, the danger is that they might!



Disk Version £12.95

Cassette £9.95

## THE ULTIMATE CONFLICT SIMULATION **THEATRE EUROPE**

Wargaming for the Commodore 64

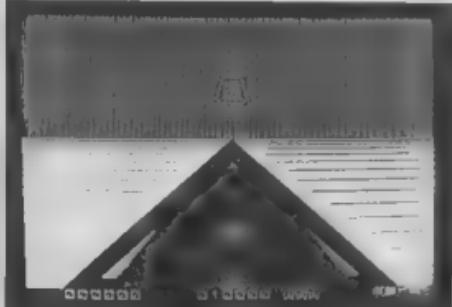




## Exhilarating

**Program** Death Star Interceptor Micro Spectrum 48K  
**Price** £7.95 **Supplier** System 3 Software, South Bank House, Black Prince Road, London SE11

**I**n the beginning was the Space Invader, a nasty little brute who just asked to be zapped. And the Space Invader begat a host of other nasty little brutes and we happily zapped 'em. But



there also came the Pam-Man, the Donkey Kong and soon, true to Darwin, the simple zap 'em game was declared primitive, obsolete - extinct!

However in the heart of the most enlightened and sophisticated games lurks a dark desire. Doomedk's forces in their majestic landscape are an awesome challenge... but

what if you could just go ZAP! Death Star Interceptor provides just the adrenal rush we all need from time to time.

Not that it really resembles its primitive predecessors. Following the Star Wars march is a brief but tricky launch sequence, complete with synthesised speech. Then the swerving and blasting of enemy craft which really do scream out of the blackness of space, following different attack patterns. Survive long enough for the Death Star to reach you and a trench sequence follows.

Yes, the shoot 'em up had evolved and how! On the lowest level the game is fast, at the highest it's crazy and the aliens bomb you. With its superior sound and fine perspective 3D there's one word for Death Star Interceptor - exhilarating! John Minson



in their present form yet ooze potential and show some excellent touches.

I found the word processor the weakest, being little more than a simple text editor. It allows insertion and deletion but nothing sophisticated like justification, block movement, etc. However it has some positive, if unusual features, most notably a count of typing speed and the ability to work with large letters on screen, useful for the poor sighted, which can also be printed on some dot matrix printers in large form as well. I suppose this is for leaflets etc, but really the program is more suited for letters than anything requiring control over page layout.

The database is extremely good, allowing quite com-

## Efficient

**Program** QL Assembler  
**Price** £39.95 **Supplier** Sinclair Research, Stanhope Road, Camberley, Surrey.

**T**his is the 'official' QL assembler, written by GST and marketed by Sinclair. It comes along with a blank cartridge, for making a back-up on, and a minuscule manual. The box is the same dimensions as the four-packs of cartridges, so the manual is

the same size, in a tiny ring binder. It uses syntax diagrams for showing the formats of commands, making the simplest thing seem complicated, and this combined with the small size makes it rather tricky to understand.

I have been using a pre-release version for months now, so I put the final product in my QL, pressed reset and waited for it to load. I waited for many minutes, before it gave me the infamous 'bad medium' error. I could not even get a directory, so I tried it in drive 2, and it actually loaded. I immediately

## Soaring

**Program** Glider Pilot Micro Commodore 64 **Price** £1.95 **Supplier** CRL Group Plc, CRL House, 9 King's Yard, Carpenters Road, London E18 2HP

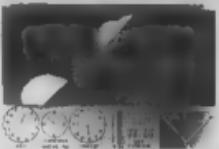
**T**his program simulates a cross-country flight in a modern, high performance, competition glider.

The objective is to complete a triangular course, approximately 160km in length, in the shortest possible time. Before the simulation starts, a selection of different weather conditions can be chosen, or you can set your own parameters. The simulated speed also has to be selected (on speed 1, real time, it will probably take about two hours to complete the course).

The controls for the glider are very simple. Unless you are already familiar with the sport of gliding, you must not know that one of the most useful techniques is thermal soaring. A thermal is a col-

umn of warm rising air, usually marked by a cumulus cloud. With a bit of skill, cross-country travel can be achieved by flying to the next visible thermal and circling in it to achieve climb.

Various simple instructions are shown on the cockpit panel - altimeter, air speed, etc. A selection of maps can be accessed to help with naviga-



tion. The view from the cockpit is the same as most other flight simulations, showing artificial horizon clouds and so on.

I quite like flight simulators, but I found Glider Pilot a bit boring. While there's nothing really wrong with the game, it just seemed a bit slow - no enemy planes to shoot or anything like that.

Tom Hussey



gram uses data obtained from the spreadsheet files, is fast, graphically attractive and produces hard copy on a range of printers but again is limited by a lack of flexibility in layout and control of scaling, etc. An ideal package for club secretaries I should imagine, or beginners who want a taste of what all these utilities can do - but not for a real business.

Tony Kendle



## Beginners

**Program** Mini Office **Price** £5.95 **Supplier** CPC 484 **Database Software**, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 8NY.

**A**t such a bargain price for 484 software you can't really go wrong, especially when you consider that you get four programs for the price of one. However I can't help wondering what it could have been like if, at twice the price, it had been made twice as good because the four utilities - word processor, database, spreadsheet and graph drawer - are restrictively simple

plex, and reasonably fast searches for different field combinations, strings, part strings and so on in the data such as 'find all people called Smith of less than 30' and this justifies the price in itself.

The spreadsheet is also superior for the money and many people will find that it contains everything they need for home use, although the formulas linking each row and column are pretty simple in their scope.

The graph drawing pro-

backed it up, and have used the copy ever since in either drive. It would seem that the duplication process used is far from reliable, as this is the only cartridge ever not to load from my QL.

The editor is the usual Metacomo one, though they get no credit for it, and as I have described it before I shall simply say it's very good. The assembler reads its source code from cartridge or disc directly, so is not as fast as a memory-based assembler would be. However, that said, it is quick, and can handle very large source files.

The assembler is very standard, much more so than some, and can assume PC mode addressing automatically, while also accepting the more usual form. It works out the I- and A-forms of instructions automatically, though only takes any notice of the first 8 characters of labels, which can be limiting. It does not have advanced features

like conditional assembly or macros though, apparently disregarded in favour of explanatory error messages. On a 128K machine, the editor can handle a maximum of around 30K per file, so for bigger programs the source has to be chopped into sections, then assembled together using an 'include' function. The assembler is very efficient in the way it uses memory, and I would estimate that object code files of over 25K could be produced without running out of memory. This is very much more than others, but as yet the assembler cannot assemble modules separately then link them to create larger files, as Metacomo's can.

This is a good, standard assembler, while lacking more advanced features, it can assemble large programs, and is relatively quick even on Microdrives.

Andrew Pennell



cuie budgets; films whose advertising screamed 'This film will sterilize you with fear'?

*Mushrooms from Mars* isn't a cheapie film but a budget game which dares court comparison with the above trash classics. Behind the sensational title lurks just another jumping/climbing game;

## Friendly

**Program Masterfile 464** Micro CPC464 Price £25.00 Supplier Campbell Amsoft, Brentwood House, 156 Kings Road, Brentwood, Essex

**E**very so often a program comes along that is a real landmark in terms of quality and price. One such is *Masterfile 464*, converted from the Spectrum version for Amsoft by Campbell Software Design. This is without question the best tape based database I have ever seen.

■ features are almost too numerous to document, but points of note are that it allows up to 34K of storage in each file and there are no fixed length records which means that there is no wasted space. There is 34K available for each individual file, like *Tasword 464*. Although the program can be transferred to disc without alteration, because everything happens in Ram files must still be that length even on disc. But this

does mean that functions such as sort and search are faster than on more disc orientated software.

To help with memory management there is a constant record on screen of the percentage of the file space used and the number of bytes free. Presentation is superb, although entirely in 80 column mode which is best on a green monitor, and there are many user friendly prompts supported by a well written manual which makes learning the program very easy.

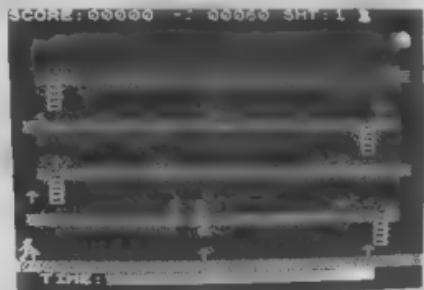
However, the most revolutionary feature is that the database allows 'relational' data with 'parent' and 'child' records. To use the manual's example, if you were storing data on your record collection a 'parent' would be an artist and this information would only be entered once. This record can then point towards several 'children' - the various album titles. Such a two tier system is by far the most efficient method of storing data.

Tony Kendle



## A turkey

**Program Mushrooms from Mars** Micro Spectrum Price £1.99 Supplier Scorpio Gamesworld Ltd., 307-313 Corn Exchange Building, Manchester 4



**N**othing Can Stop Them! See Weird Green Horrors Drop From Above! There Are The Mushrooms From Mars!!!

Golden Turkeys are films so bad they're laughably enjoyable. Films which boast titles as oxenously unusable as *Plan Nine From Outer Space*; films which hysterically promise more than they can ever deliver on their minis-

Rule One - turkeys disguise their lack of originality. Compared with the *Alien* & it looks cheap and simple.

But *MIM* isn't quite that bad or incompetent ■ fact for a cheap and simple game it won't exactly 'sterilize' you with excitement but it could give a few hours pleasure.

John Minson



## Giant video

**Program World Series Baseball** Micro Commodore ■ Price £7.98 Supplier Imagine, Ocean House, 6 Central Street, Manchester 2

**R**emember Rounders? You know... the game you played in primary school where you could have boys and girls on the same team.

Well, in America, they give players lots of padding and funny gloves, stage it in front of 20,000 people and call it baseball.

Now all ex-patriots and interested parties can indulge in this curious American pastime on their micros, courtesy of the born-again Imagine.

It has to be said the graphics, depicting the playing field, stadium and giant video screen are very impressive indeed... together with the sound - a fine imitation of the thwack of leather on willow... ah, no, that's another game, isn't it.

The program itself plays well when you get the hang of

it, with one player (versus computer) or the more entertaining two players options. I say when you get the hang of it because comprehensive though the instructions are, if you don't know the actual rules of baseball, you're in trouble. This is a silly omission for a game presumably aimed at the UK market.

In charge of the batting or



fielding side, all action is easily controlled by joystick, with the nice effect of the actual batting being shown on the giant video screen.

For baseball fans it's all here, nine innings of pitching, hitting, running, and stealing, all beautifully animated.

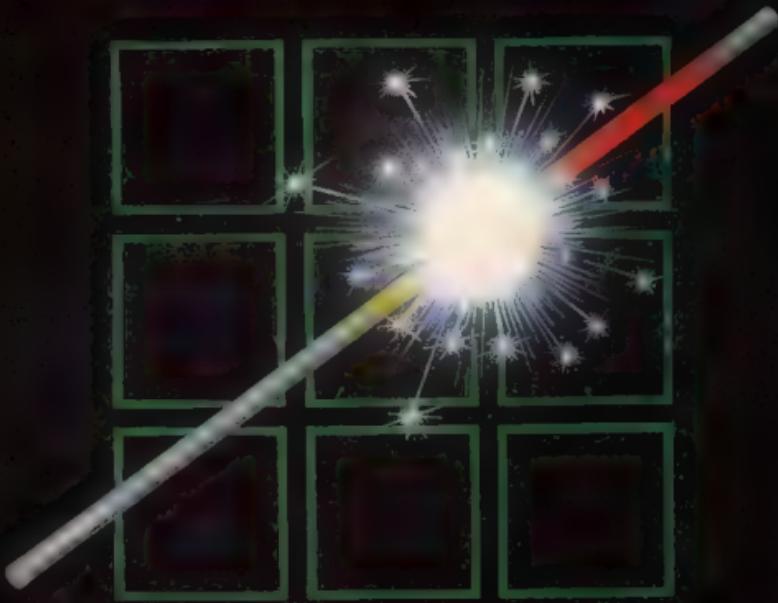
Me, I'll wait for the American Football version.

John Cook





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A collage of various computer screens showing different programs and games, overlaid with text advertising the Sharp MZ-700 series. The screens display a variety of games including a maze, a space ship, a racing game, a 3D-style game, and a text-based game. Overlaid text includes 'SHARP MZ-700', 'OVER 140 PROGRAMS', '4 BOOKS', '12 PERIPHERALS', 'SPECIAL OFFER', 'SEND FOR OUR COLOUR CATALOGUE NOW', and 'SOLO SOFTWARE'. The background is a red textured surface.

## ***Competition***

## Win a copy of Chuckie Egg 2!

This week *Popular Computing Weekly* is giving away 24 copies of the spectacular sequel to *Chuckle Egg - Chuckle Egg II*. It's a giant 120 screens of egg-orientated mayhem.

The original **Chuckie Egg** was one of the best platform and ladders games ever, fiendishly designed to push your judgment and responses to the limit. **Chuckie Egg** puts the hero of that program, Hen House Harry in a chocolate egg factory where he must assemble the parts of some chocolate Easter eggs.

Finding and assembling all the parts you need will test your arcade credibility as never before - it'll also test your wits, and you can get a copy free.

## The Prizes

*Popular Computing Weekly* is giving away 12 copies of the Spectrum version of *Chuckie Egg 2* and 12 copies of the Amstrad version. Make sure you specify which one you require on your competition entry form.

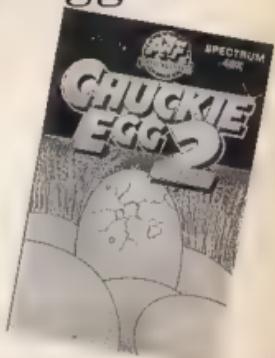
## The Competition

All you have to do is answer the three questions below:

- 1) What was the name of the famous Hollywood actor who took part in an egg eating contest in *Cool Hand Luke*?
- 2) What animal used to be printed on eggs?
- 3) Which egg fell off a wall?

## How to enter

If you think you know the answers to the questions above fill in the coupon below, complete with your name and address and which machine you own. The address to send your completed coupon is: *Popular Computing Weekly* 12-13 Little Newport Street, London WC2H 7PP. Closing date for the competition is April 26th.



Chuckie Egg Competition	
Name .....	Answers
Address .....	1) .....
.....	2) .....
.....	3) .....
.....	Micro .....

## First off the mark

Christina Erskine talks to Sara Galbraith of First Publishing

**F**or sometime now, people have been waiting in the wings for the games craze to end and for micro users en masse to demand more useful things to do with their machines. Last year, Triptych Software decided the time was right with its Brainpower range.

This year, Sara Galbraith reckoned, will see a mass market being created for serious software - a demand which she hopes her company, First Publishing will fulfill.

At 26, Sara is too old to be the archetypal computer whiz-kid ("it all began when I built the ZX80 from kit form in my bedroom") and too young to be the seasoned entrepreneur ("The corporation looked at the latest figures for micros and we reckon it's a high growth, hi-tech industry").

In fact, she started her high growth, hi-tech career as a restaurant cook at 16 years old. "It was good fun, but after a while I realised that I wasn't going to get very far if I carried on drinking so much. What with boozy lunches and people sending drinks into the kitchen all evening while I was seeing to the meals, and then nightcaps to relax afterwards, I was looking aged at 17," said Sara frankly. Actually, she doesn't look the least like the sort of person to be weaving tempestuously over a charcoal grill with a bottle of sherry in one hand and a cha-teaubriand in the other.

She looks the very image of the successful business woman - an image carefully cultivated, since as she admits if you don't look successful, no-one will believe you are.

First Publishing eventually came about as a result of frustration. Sara had spent two years at Peachtree and Precision Software, following her stint as a chef and a further period as a secretary. She felt that both the software companies were lacking in flexibility.

"Peachtree was full of very able, experienced men - with all the flexibility of an iron bar. I was working on the educational software division, and felt that not enough money was being put in to that side of it.

"I moved on to Precision, where the product was good, but the marketing non-existent. It was easy to see what they should be doing, marketing-wise, but again difficult to get people to act on it.

"There was one incident particularly; I had suggested the name *First Base* for one product - I thought it would be especially good for the American market - which wasn't taken up. When I started First Publishing I used the title myself, only to discover Precision had

just brought out a product called *First Base*."

So, in order to be able to implement her own ideas - of which she had and has plenty - Sara decided to set up on her own. The German company Data Becker put up the capital for her to start. "After writing begging letters for capital, which didn't work, I met Becker himself in Germany and discovered he agreed with my ideas.

"With the packages we release, I want to establish a reputation for quality - become the Marks and Spencer of software, if you like. That's why I feel the branding and packaging is very important, because I want it to be instantly recognisable."

The packaging is distinctive - blue and yellow the theme through the whole range. The range itself consists of word processor, databases, spreadsheets, assembler/monitor, Pascal and books, which complement and integrate with the software.

Why, I asked, are these any better than similar products brought out from other companies, apart from the fact that they're cheaper, ranging from £19.99 for the Assembler/Monitor to £35.99 to *FirstWORD 64* and *FirstBASE 64*.

"*FirstBASE*, the data manager, is just as good as *Superbase* (Precision's flagship product), but at a third of the price. *FirstWORD* is a very easy-to-use word processor - about the only one you can load and use right away.

"*PowerPLAN 64*, which is £44.99, is extremely powerful, and the Pascal has been very highly praised."

So far, all First Publishing's releases have originated from Data Becker and been translated at First Publishing from the German. Is this relationship set to continue or will First be using software



from other sources?

"Both," said Sara firmly. "Firstly, I'm taking Data Becker's product because I want to. There's nothing in the contract that says I have to use it - the companies are entirely separate. However, the product is so good, that I definitely do want it.

"Then I want to branch out and use freelancers over here too."

Had she anyone particular in mind?

"Well, I'd love to get Simon Traumer to do some writing for First - unfortunately, he's not freelance, he works full-time for Precision."

And what about writing for other machines? The Commodore has a vast user-base, but it would seem a good idea to take advantage of the newer machines looming up.

"We have plans to convert and rewrite to the Amstrad and the Atari ST - in fact, the first Amstrad product should be out very soon."

Sara obviously has faith in Jack Traumer's ability to deliver exactly what he says he'll deliver when he says he'll deliver it. "Well, I'm not sure about the timing, but yes, I have faith in the machine. We have someone at Data Becker working very closely on the Atari ST in Germany, so we know a little about its progress."

The decision to go with the Amstrad and Atari is largely tied up with the Data Becker relationship. Three other companies, in France, Holland and the US, also work with Data Becker in the same way as First Publishing.

Atari and Commodore machines are popular in all five countries - Amstrad does well in Germany and the UK.

First Publishing has now been established for six months and has grown to eight staff - how does Sara view her achievements?

"We did have problems at first - I expected our first releases to be out last October, but they didn't appear until December, so we lost three months of prime selling time.

"But sales have been good - surprisingly good. I have two permanent sales staff, who are out on the road selling straight to dealers. I prefer to sell direct, although we do use Micro Dealer UK for some distribution.

"My first objective is to make the company stable - I intend to be around for a long time - then I might start taking risks.

"People may not be using their micros for our applications in any great number just yet, but I want to create a mass market for serious software, even if it's non-existent at the moment."

"Looking back, I can't imagine really why I set up on my own. It certainly isn't easy, and I do wish at times that there was someone else to blame occasionally when I make the wrong decisions."

Sara admitted, however, that at least she can take all the credit as well when things go right.



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# Shipwrecked

Not Desert Island Discs... but a text-only adventure for the CPC464 by Steve Lucas

Two months ago, I set sail to search for the mysterious island of Doctor Klein. Last night, after many hours of storms, the ship struck a rock and sank. Fortunately, I managed to find a piece of driftwood to hold on to and when I woke this morning, I find that I am floating only a few feet from shore. Please help me to find a boat and row to safety by giving me instructions in the form of two word sentences such as GET ROPE, CLIMB HILL, etc. To move

around, you just need to use a single letter N, S, E or W.

Here is a list of some of the words I understand. Go, In, Out, Up, Down, North, South, East, West, Help, Swim, Row, Sail, Paddle, Climb, Eat, Drink, Inventory, Score, Drop, Leave, Put, Get, Take, Grab, Look, Examine, Search, Lift, Unlock, Wear, Read, Launch

**Program Notes**

S%(x,y) holds map

B%(x,y)	pointer to location of objects
N&(x)	pointer to words understood
N\$(x)	words understood
Q\$(x)	description of location
G\$(x)	description of objects
S%(x,y)	map
P%	current location
AA-AZ	flags
E%,F%	check for objects
Z\$	input sentence
B\$,C\$,D\$	first word input
L\$	second word input

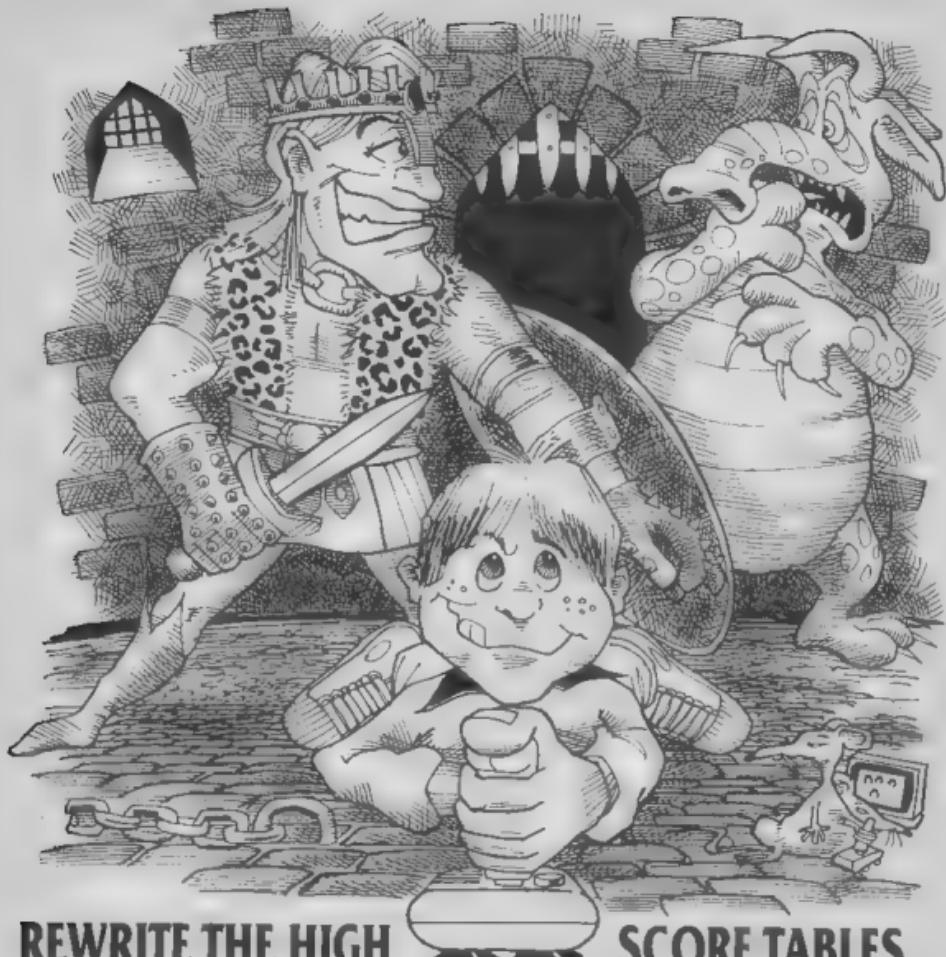


10 HODE 1:BORDER T:INK 0,0:INK 1,6:INK 2,24:INK 3,18  
 20 LOCATE 14,3:PEW 1:PRINT "Shipwrecked"  
 30 LOCATE 1,7:PEW 2:PRINT "An adventure q  
 uo for the Astradr CPC464";  
 40 LOCATE 5,12:PEW 3:PRINT "C" Steve W  
 . Lucas. November 1984"

■■■ PEW 1:PRINT 1  
 60 DIM s\$(21,4),b\$(21,1),n\$(21),z\$(21),q  
 \$(21),g\$(21),v\$(5)  
 ■■■ RESTORE:FOR x=1 TO 21:READ q\$(x):FOR  
 y=1 TO 4:READ s\$(x,y):NEXT y,x  
 ■■■ FOR x=1 TO 21:READ g\$(x),b\$(x,1),n\$(x  
 1),z\$(x,1):NEXT  
 90 CLS:WHILE z\$(2) < 999  
 100 IF p1=3 THEN au="surv":IF au>3 AND  
 w=0 THEN x="#The wolf attacks we!":GOSUB  
 760  
 110 IF p1=10 THEN x="#ex+1":IF ax>3 AND  
 w=0 THEN x="#The monster turns round and  
 sees me. A jet of flame springs from it  
 s mouth":GOSUB 760  
 120 IF p1=7 AND ak(2 THEN aeq=q1:IF  
 w>3 THEN x="#The farmer comes over and hi  
 ts me!":GOSUB 760  
 130 IF p1=3 THEN ap=q+1:IF ap>7 THEN x#  
 ="The lizard attacks we!":GOSUB 760  
 140 IF at=1 THEN PRINT "#I am wearing some  
 worries!"  
 150 PEW 1:PRINT "#I am -7:PEW 1:PRINT q\$(p  
 1):PRINT "#IF x\$(p,1)>0 THEN w="#North"  
 160 IF x\$(p,1)>0 AND LEN(a\$)=0 THEN w#  
 "South" ELSE IF x\$(p,1)>0 THEN w="#S",  
 "South"  
 170 IF x\$(p,1)>0 AND LEN(a\$)=0 THEN w#  
 "East" ELSE IF x\$(p,1)>0 THEN w="#S", "E  
 ast"  
 180 IF p1=8 THEN w="#To the shore!"  
 190 IF x\$(p,1)>0 AND LEN(a\$)=0 THEN w#  
 "West" ELSE IF x\$(p,1)>0 THEN w="#S", "W  
 est"  
 200 IF p1=14 THEN w="#Up" ELSE IF p1=13  
 THEN w="#S+", "Down" ELSE IF p1=12 THEN w#  
 "S+", "In"  
 210 PEW 2:PRINT "#I can travel i-":P  
 ■■■ 1:PRINT 4  
 220 a=0:FOR t=1 TO 21:pp1=0:IF b\$(t,1)=p  
 ■■■ T:THEN pp1=1  
 230 IF pp1=1 THEN 250  
 240 NEXT:t=0  
 250 w=0:THEN PEW 2:PRINT "#PRINT" i can  
 see :":PEW 1  
 260 IF p1=14 AND w=0 THEN PRINT "#I knock  
 on the door."  
 270 PRINT q\$(t):t=1:GOTO 240  
 280 PRINT FEN 2:INPUT "#What shall I do?";  
 z#:z#=LOWER(z\$(t,1):b#=LEFT\$(z#,2):c#=LEFT\$  
 (z#,3):d#=LEFT\$(z#,4)  
 290 CLS:PRINT CHR\$(7):IF c\$="#loa" OR c\$#  
 "ex" THEN PRINT "#I can see nothing speci  
 al!" ELSE IF c\$="#see" THEN PRINT "#I have  
 't found anything at all!"  
 300 IF c\$="#eat" THEN PRINT "#I'm not hungr  
 y!" ELSE IF c\$="#drin" THEN PRINT "#I'm not  
 thirsty!"  
 310 IF c\$="#sco" THEN PRINT "#What do you t  
 hink this is...a game?" ELSE IF c\$="#get

" OR c\$="#tak" OR c\$="#gra" THEN GOSUB 430  
 ELSE IF c\$="#op" ■■■ c\$="#cli" OR d\$="#go u  
 " THEN GOSUB 690  
 320 IF c\$="#inv" THEN GOSUB 710 ELSE IF c  
 ="#dro" OR c\$="#lea" OR c\$="#put" THEN GOS  
 UB 600 ELSE IF c\$="#kno" THEN GOSUB 810 E  
 LSE IF c\$="#thr" THEN GOSUB 850  
 330 IF c\$="#pas" OR c\$="#swi" THEN GOSUB 7  
 40 ELSE IF c\$="#lit" THEN GOSUB 800 ELSE  
 IF c\$="#hel" THEN PRINT "#I'm sorry. I'm as  
 confused as you are!"  
 340 IF (b\$="#n" OR d\$="#n") AND s\$(p2,1)  
 THEN p2=1:GOSUB 90  
 350 IF b\$="#s" OR d\$="#s" AND s\$(p2,2)  
 THEN p2=s\$(p2,2):GOSUB 90  
 360 IF (b\$="#e" OR d\$="#e") AND s\$(p2,3)  
 THEN p2=s\$(p2,3):GOSUB 90  
 370 IF (b\$="#w" OR d\$="#w") AND s\$(p2,4)  
 THEN p2=s\$(p2,4):GOSUB 90  
 380 IF b\$="#n" OR b\$="#s" OR b\$="#e" OR b\$="#  
 w" THEN PRINT "#I can't go that way!"  
 390 IF c\$="#un" THEN GOSUB 790 ELSE IF c  
 ="#in" OR d\$="#go i" THEN GOSUB 930 ELSE  
 ■■■ c\$="#w" THEN GOSUB 1010  
 400 IF c\$="#rea" AND p1=11 THEN PRINT "#It  
 reads ... beware of fish!" ELSE IF c\$="#r  
 ea" THEN PRINT "#I can't see anything to r  
 ead!"  
 410 IF c\$="#dow" OR d\$="#go d" THEN GOSUB  
 940 ELSE IF c\$="#use" OR c\$="#chi" THEN G  
 OSUB 950 ELSE IF c\$="#wur" OR c\$="#sai" OR  
 c\$="#lau" THEN GOSUB 960  
 420 WEND  
 430 GOSUB 550:IF i>1 THEN RETURN  
 440 a=0:FOR h=1 TO 21:IF b\$(h,1)=p1 AND  
 h>1 THEN p1=1  
 450 MEET:IF x\$=0 THEN PRINT "#I don't see  
 it here!":RETURN  
 460 IF r=10 THEN PRINT "#I can't lift it!"  
 ■■■ RETURN ELSE IF r=1 THEN ab=1 ELSE IF r=2  
 THEN x\$="#I get a hernia with the effor  
 t!":GOSUB 760  
 470 IF r=3 THEN ac=1 ELSE IF r=4 THEN x\$#  
 ="#It sticks its venom deep into my leg!":  
 GOSUB 760  
 480 IF r=5 THEN x\$="#I cut myself and ble  
 ed to death!":GOSUB 760 ELSE IF r=6 THEN  
 ab=1 ELSE IF r=7 THEN ac=1 ELSE IF r=8  
 THEN PRINT "#Don't be absurd!":RETURN  
 490 IF r=9 THEN x\$="#I bite them head off  
 !":GOSUB 760 ELSE IF r=10 THEN ab=1 ELSE  
 IF r=11 THEN ac=1 ELSE IF r=12 THEN x\$#  
 ="#It goes for my throat!":GOSUB 760 ELSE  
 IF r=13 THEN ab=1  
 500 IF r=14 THEN PRINT "#Don't be silly!":  
 RETURN ELSE IF r=15 THEN ab=1 ELSE IF r=16  
 THEN ac=1 ELSE IF r=17 THEN PRINT "#Don  
 't be absurd!":RETURN  
 510 IF r=18 THEN ab=1 ELSE IF r=19 THEN  
 PRINT "#It's stuck!":RETURN ELSE IF r=20 T  
 HEN ab=1 ELSE IF r=21 THEN ac=1  
 520 d=0:FOR d=1 TO 4:IF v\$(d)="# THEN  
 v\$(d)=q\$(n\$(r)):z\$=z\$+d:5  
 530 MEET:IF x\$=0 THEN PEW 3:PRINT "#I'm so  
 rry my hands are full!":RETURN  
 540 b1\$(n\$(r),1)=0:RETURN  
 550 l\$="#":FOR h=1 TO LEN(z\$)

560 IF MID\$(z\$,h,1)="# THEN l\$=RIGHT\$(z  
 \$,LEN(z\$)-h):h=90  
 570 MEET:r=r+1:z\$=0:LEN(l\$)=2 THEN RETU  
 RN  
 580 FOR h=1 TO 21:IF LEFT\$(n\$(h),LEN(l\$)  
 )=l\$ THEN l\$=r:r=h  
 590 MEET:RETURN  
 600 GOSUB 550:IF i>1 THEN PRINT "#I don't  
 see a "#:RETURN  
 610 e1=0:FOR d=1 TO 4:IF v\$(d)=q\$(n\$(r))  
 THEN v\$(d)="#":z\$=z\$+l\$  
 620 MEET:■■■ z\$=1 THEN PRINT "#I'm not car  
 ying it!":RETURN  
 630 b1\$(n\$(r),1)=p1  
 640 IF p2=13 AND r=1 THEN w="#PRINT "#The  
 wolf grabs it!":z\$=q\$(l\$):z\$="s few  
 bones"  
 650 IF p2=18 AND r=15 THEN w="#PRINT "#  
 e monster turns into Doctor Klein and ■■■  
 thanks me for my kind gift!":z\$=q\$(l\$):  
 660 IF r=1 THEN ab=0 ELSE IF r=3 THEN ac  
 =0 ELSE IF r=6 THEN ab=0 ELSE IF r=7 THE  
 N w=0 ELSE IF r=10 THEN ab=0 ELSE IF r=11  
 THEN ac=0 ELSE IF r=13 THEN ab=0 ELSE IF  
 r=15 THEN ab=0  
 670 IF r=6 THEN ab=0 ELSE IF r=10 THEN al=0 ELSE IF r=21  
 THEN ac=0  
 680 IF r=4 AND p2=11 THEN w="#PRINT "#I  
 drop the plant and walk across it. No so  
 oner than I reach the other side than th  
 e fish attack it and it falls into theri  
 ver."  
 690 IF r=18 AND p2=17 AND ak(2 THEN ak=6  
 :z\$=0:PRINT "#The farmer thanks me and run  
 s off!":z\$=(18):z\$=q\$(l\$):z\$="some dog hairs  
 "#  
 700 RETURN  
 710 PEW 3:PRINT "#I am carrying i-":PEW 1:  
 l\$=0:FOR h=1 TO 4:IF v\$(h)<>" THEN PRIN  
 T 1 v\$(h):f\$=1  
 720 MEET:IF x\$=0 THEN PRINT "#Nothing at a  
 l!"  
 730 PRINT:RETURN  
 740 IF p1=1 THEN p1=2:PRINT "#O.K.":RETURN  
 ELSE IF p1=11 OR p1=12 THEN x\$="#The fis  
 h eat straight through my flesh!":GOSUB  
 760  
 750 PRINT "#I can t ■■■ that here dummy!":R  
 ETURN  
 760 CLS:PEW 1:LOCATE 1,5:PRINT x\$  
 770 PEW 2:LOCATE 1,7:PRINT "#I am dead. Wo  
 uld you like another game?"  
 780 a\$=INKEY\$:z\$=LOWER\$(a\$):IF a\$="#y" O  
 R a\$="#Y" THEN RUN  
 790 IF a\$="#n" OR a\$="#N" THEN LOCATE 1,20  
 :PRINT "#Goodbye. Thank you for playing!":  
 END ELSE RUN  
 800 IF p2=2 AND ab=0 THEN PRINT "#I lift t  
 he rock.. I see something!":z\$=(18):z\$=a  
 n g rope":z\$=0:RETURN ELSE IF p2=2 THEN PR  
 INT "#I don't think my back would stand ■■■  
 at again!":RETURN ELSE PRINT "#Not here!":  
 RETURN  
 810 IF p2=3 THEN x\$="#A giant Ogre answer  
 s the door, sees me and decides to eat

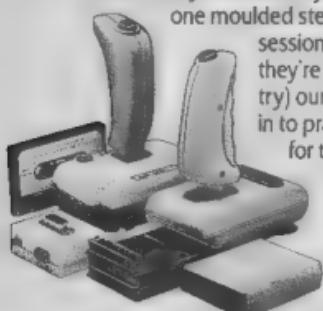


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```

!w! :GOSUB 760
820 IF p1<14 THEN PRINT"Net here!":RELU
830 IF an=0 THEN an=1:PRINT"A friendly dwarf answers the door, dragging something out and closes the door behind him.":g1$(11) = "a small rowing boat":RETURN
840 PRINT"The dwarf answers and has a conversation with me.":RETURN
850 GOSUB 550:IF r<3 THEN PRINT"I can't see any point in doing that!":RETURN
860 IF p1<3 THEN PRINT"There isn't much point in doing that!":RETURN
870 IF a=0 THEN a=1:PRINT"The rope catches on the tree and I tie it firmly.":z$="drop rope":GOSUB 600:g1$(3)="a rope I'm angling from the tree":RETURN
880 PRINT"How can I do that?":RETURN
890 GOSUB 550:IF r=3 AND Pl=3 AND an=1 THEN PRINT"i climb up!":RETURN ELSE
IF r=3 THEN PRINT"Net yet!":RETURN
900 IF p1<4 THEN x$="slip and break my neck!":GOSUB 760 ELSE IF pl=14 THEN pl=13:PRINT"O.K.":RETURN ELSE PRINT"i can't do that here!":RETURN
910 IF p1<7 THEN PRINT"I can't do that here stupid!":RETURN ELSE IF aj<1 THEN PRINT"i don't have the key dummy!":RELU
915 H
920 PRINT"O.K.":x1$(7,2)=8:aj=2:z$="drop key":GOSUB 600:g1$(17) = "":RETURN
930 IF p2=12 THEN p1=13:PRINT"O.K.":RETURN ELSE PRINT"Don't be silly!":RETURN
940 IF p1<13 THEN p1=14:PRINT"O.K.":RETURN ELSE PRINT"i can't be that here!":RELU
950 GOSUB 550:IF r>7 THEN PRINT"i can't use a life":RETURN
960 IF an<1 THEN PRINT"i need some wood":RETURN ELSE z$="drop logs":GOSUB 600:PRINT"i chisel away and make some parts":RETURN

```

15,0,11,8,0  
1070 DATA on the northern banks of a narrow river. I can just make out some fish swimming, 10,0,0,0, on the river banks. There is a wooden hut to the west, 0,17,1 3,0

1000 DATA at the top of a long winding staircase leading down between two high brick walls, 0,0,0,12, at the bottom of some stairs. There is a small door here, 0,0,0,0

1110 DATA 18,17,20,19, on a sandy beach.  
There is a gloomy forest to the west  
0.0.0.19 is a small ravine and 0.0.0.2

1120 DATA a small fish,1,fish,a large rock,2,rock,"",2,rope,a menacing lizard,3,lizard

1130 DATA a rusty tin,4,tin,a plank of wood,5,plant,a chisel,16,chisel,a large door knocker,9,knocker,a menacing two headed monster,18,monster,a cauldron of fee

1150 with a pair in Wellingtons, 12, Wellingtons, a pile of logs, 19, logs

The logo for ANF Software is a circular emblem. The word "ANF" is prominently displayed in the center in a large, bold, italicized font. Above "ANF", the word "SOFTWARE" is written in a smaller, all-caps font, and below it, "ANF" is repeated in a smaller, all-caps font. A banner or ribbon is draped across the bottom of the circle, with the words "NULLI SECUNDUS" written on it in a bold, all-caps font. The entire logo is rendered in a dark, monochromatic color scheme.

## Codify your code

*Hot up your code storage on the Spectrum with this program by Tony Dexter*

**M**ost programmers are avid collectors of published machine code routines, and quickly accumulate a large number. The usual practice is to key these in from the published listing and then, after testing, to save on cassette for possible future use. Many such routines occupy very little tape space and a single C15 cassette might hold up to 30 code snippets on each side.

Since each set of code occupies such a short length of tape, finding any particular routine can be tricky. It is all too easy to Fast Wind right past the bit of code you want. This is particularly so when you mislay the scrap of paper detailing the cassette's contents, or find an unlabelled cassette, or one in the wrong box.

This program creates an expandable Index Program which is positioned at the beginning of each side of a cassette. As you add routines to the cassette you also note the details within the Index program.

Then when you later seek a particular item all the required details are there, inseparable from your programs.

Of course such catalogue programs have been published for Basic program storage. This program is unusual in that it can *Auto-Load* machine code. This would seem to present problems in that most machine code *Loading* requires a *Clear* instruction (to lower Ramtop), and a *Clear* instruction also *Clears* the variables and you thus lose your data.

This program gets around the problem by selecting the information it will require for the *Load*, and *Poking* this, in numeric form, to be stored in the printer buffer. It retrieves this information, after the *Clear* instruction, and re-establishes the necessary variables.

After keying in the listing Run the program. You will be presented with a blank Index, with options to enter program data, load a program, or save the input. Put a new cassette in your recorder, set the tape counter to zero and select the Save Index option. This establishes a new entry point in the Index program which preserves previously established variables.

After any new piece of code is saved on the cassette you should make a note of the tape counter settings at the beginning and end of the save. Now run back the tape and Load the index program. Select the enter data option, and answer the prompted questions. Your code will be labelled as being either relocatable or not. If it is not relocatable then you will need to enter the address from which the code was saved. If the code can be used at any suitable location then the address

is unimportant, although the length of code is.

The program in this case stores the number of bytes occupied. After keying in the relevant information you should select the **save** option once more, thus preserving your updated index.

This procedure is by no means complex and quickly becomes a habit. It does add a couple of minutes to the time it takes to serve a particular routine, but it is time well spent. The index is designed

to hold up to 30 routines.

When you wish to *Load* a code routine you simply *Load* the index, select your routine from the list presented, and follow the instructions to *Auto-Load* the selected piece of code. If the code is not relocatable, then it will be loaded back to the correct address. In all other cases you will be informed of the length of code in bytes, and asked to key in your chosen location. The program will automatically suitably lower Ramtop and carry out the *Load*.

As far as possible the program is protected against mistakes in user-entry with extensive checking. If a program break does occur then **Enter < GOTO help >** when you will be returned to the Menu with all variables intact.

```

30 DIM a$(30): DIM c$(30,10): DIM b$(30): B1K r$(30): B1M s$(30): B1R f$(30)
29 LET count=0
30 LET help$="60: GO TO help
40 CLS : LET count=<count>
50 INPUT #11 21,0,1AT 10,0;"ENTER THE NAME CODE WAS SAVED BY?": IF l$="" THEN
60 TO 50
55 LET LEM i$(10) THEN 80 TO 50
70 LET c1count=1$:
80 PRINT AT 0,0;l$:
90 INPUT #11 21,0,1AT 10,0;"IS THE CODE RELOCATABLE? Y/N": IF l$="Y" OR l$="y" THEN
100 LET r$(count)=1$:
100 PRINT #11 0,0;c$(count); INVERSE l$;"#R AND r$(count)": INVERSE 0
110 IF r$(count)=0 THEN 60 TO 170
120 INPUT #11 21,0,1AT 10,0;"LENGTH OF CODE? HOW MANY BYTES?": l$=0: IF l$="" THEN
130 LET l$=120
130 FOR i=1 TO LEM l$: IF CODE i$(1)(40 OR CODE i$(1))=57 THEN 80 #11 120
140 NEXT i
150 LET b$(count)=VAL l$:
160 PRINT AT 0,0;c$(count); "#b$(count)": BC #11 230
170 INPUT #11 21,0,1AT 10,0;"ADDRESS FOR START OF CODE?": l$=0: IF l$="" THEN
170
180 FOR i=1 TO LEM l$: IF CODE i$(1)(40 OR CODE i$(1))=57 THEN 80 TO 170
180 NEXT i
190 LET b$(count)=VAL l$:
200 IF b$(count)=VAL l$:
210 IF 0,0;c$(count); r$(count)=0 THEN #11 170
220 PRINT AT 0,0;c$(count); "#b$(count):
230 INPUT #11 21,0,1AT 10,0;"TAPE COUNTER POSITION STARTS AT?": l$=0: IF l$="" THEN
230 TO 230
240 FOR i=1 TO LEM l$: IF CODE i$(1)(40 OR CODE i$(1))=57 THEN 80 #11 240
240 NEXT i
250 LET s$(count)=VAL l$:
270 PRINT AT 0,0;c$(count); "#b$(count); " INVERSE l$;"#R AND r$(count)": INVERSE 0;"$s$(count):
280 INPUT #11 21,0,1AT 10,0;"TAPE COUNTER POSITION ENDS AT?": l$=0: IF l$="" THEN
280 TO 280
290 FOR i=1 TO LEM l$: IF CODE i$(1)(40 OR CODE i$(1))=57 THEN #11 290
290 NEXT i
310 LET f$(count)=VAL l$:
320 PRINT AT 0,0;c$(count); "#b$(count); " INVERSE l$;"#R AND r$(count): INVERSE 0;"$s$(count); "#b$(count):
330 INPUT #11 21,0,1AT 10,0;"DATA O.K.?: ENTER Y OR N": l$=0: IF l$="N" #11 l$="a": TH
EN LET loci=loci-1: GO TO 40
340 RETURN
350 STOP
360 BORDER #1 PAPER 64 INK 0: CLS : PRINT PAPER 7;" MACHINE CODE
370 LET start=1:
380 PRINT INK 7; PAPER 2;"No.": TAB 4;"Name":TAB 17;"Bytes":TAB 25;"Counter":TAB
26;"l$":Addr
390 LET end=start+14: IF end>count THEN LET end=0:
400 IF count=0 THEN FOR i=start TO end: PRINT #11 a$(i):TAB 15; INVERSE l$;"#R AND r$(i): INVERSE l$;"#b$(i): INVERSE 0;"$s$(i): TAB 26;"1" AND s$(i): AND s$(i)(10)+"C" AND s$(i)(10)+"C" AND s$(i)(10)+"C" AND s$(i)(10)+"C":NEXT i

```

```

410 IF count>0 THEN PRINT "INVERSE 117R"; INVERSE #1 PAPER 73" INDICATES RELOC
ATABLE CODE
420 IF COUNT<0 THEN LET S=(COUNT)+2: PRINT PAPER 41" SAVE NEXT CODE FROM
"17AB 0E17" AND S1011101" AND S110015
430 PRINT AT 20,0" INVERT PAGE (ENTER DATA) LOAD CODE (SAVE IN
S1111 PRINT 111" PRESS A LETTER*
440 POKE 23450,8
450 IF INKEY$="" THEN GO TO 450
460 LET I$=INKEY$: IF I$="" THEN #1 TO 460
470 POKE 23450,0
480 IF I$="M" THEN LET start=start+(15 AND count)>15 AND start(I$)=15 AND star
t(I$)=CLB: #1 #1 TO 380
490 IF I$="E" THEN GO TO 490: #1 TO 360
500 IF I$="S" THEN CLS: PRINT #1 10,0;"REMOVED THE TAPE AND PREPARE TO RECORD
"1 GIVE "INDEX" LINE 360: CLS: PRINT #1 10,9;"FLASH 1;"STOP RECORDING": FOR I=1
TO 20: BEEP 1,200: NEXT I: #1 TO 360
510 IF I$="L" #1 count(I THEM #1 #1 TO 520
520 INPUT "ENTER NUMBER OF CHOSEN CODE" I$: #1 I$="*" THEN #1 TO 520
530 DEF FN b(z)=INT (z/256): DEF #1 I(z)=FN b(z)1256: DEF #1 I(z)=PEEK z1256
PEEK t+1)
540 FOR I=1 TO LEN I$: #1 CODE I$(I)<48 #1 CODE I$(I)>57 THEN #1 TO 520
550 NEXT I
560 LET sel=VAL I$: IF sel>count OR sel<1 THEN GO TO 520
570 LET s#=8*(sel): FOR I=10 TO 1 STEP -1: IF CODE s#(I)>32 THEN LET s#=s# I
-1:1: NEXT I
580 LET y=23296: FOR I=y TO y+9: POKE I,32: NEXT I: FOR I=y TO (y-1):ER s#: PO
KE I,CODE s#(I)-(y-1): NEXT I
590 POKE y+10,FM 11b(sel): POKE y+11,FM b(b(sel)): POKE y+12,FM 1(sel)): POKE
E y+13,FM b(b(sel))
600 CLS: SF rsel=0 THEN #1 TO 650
610 PRINT AT 10,0;I(sel): PRINT "YOUR CODE LENGTH = "1b(sel)" BYTES": PRINT
"FROM WHERE DO YOU WISH #1 LOAD THIS CODE?": INPUT "ENTER ADDRESS
#1: IF I$="" THEN #1 TO 610
620 FOR I=1 TO LEN I$: IF CODE I$(I)<48 OR CODE I$(I)>57 THEN #1 TO 610
630 LET ad=VAL I$: POKE y+10,FM 11d: POKE y+11,FM b1d:
640 IF ad<29999 THEN #1 TO 610
650 #1 r(sel)=0 THEN LET ad=r(sel)
660 CLEAR ad-1
670 LET y=23296
680 LET ad=27976 I(y+10)
690 LET s#=": FOR I=y #1 y+9: LET s#=s#CHR I(PEEK I): NEXT I
700 FOR I=10 TO 1 STEP -1: #1 CODE s#(I)>32 THEN LET s#=s# I-1:1: NEXT I
710 LET s#=FM I(y+12)
720 CLS: PRINT AT 10,0;" RUN THE TAPE #1 COUNTER SETTING "1#1
: PRINT " AND PLAY THE TAPE"

```

```

730 LOAD #CODE ad
740 CLS: PRINT AT 10,0;#1" CODE": PRINT "LOADED TO "ad
750 PRINT "NOW LOAD YOUR BASIC PROGRAM OR ENTER ""NEW"""
760 STOP

```



Name, rank and number

*A superfast index creation and search program for the BBC B by Calvin Wooding*

**H**ave you ever tried to use one of those expensive commercial database discs to make an index, and found that it takes so long to get used to it you wished you hadn't bothered? Have you nevertheless persisted and found that a search of your index is so slow you could have found the reference quicker without the database? Are you still interested in computerising indexes or catalogues? ■■■ read on

Tracer is a compact database program designed for index creation and searching. As a result of its small size it leaves 23000 bytes free for text, and is thus able to transfer to memory 880 x 40-byte records; generally sufficient, for example, for 24 issues of the average magazine. Because of its fast action it does this in less than four seconds, and it can search such an index for a keyword **up to** 12 letters in less than five seconds. It is therefore able to find references to items of interest in significantly less time and with greater accuracy than a visual search through a printed version of the index.

Tracer has a wide range of applica-

tions. Its speed and ease of use make it an ideal cataloguing tool for school libraries, resources, even for basic school records, marks, etc. Because of its simple design it has proved to be an ideal introduction to information storage and retrieval for children of primary age upwards being comprehensively error trapped, and very user friendly.

The listings will be provided in four parts. This week the "New Index" program which calls and is called by the Main Program, is presented. Next week and the week after will deal with the main program which will overlay the New Index program and provide the procedures to enable you to Load an index, Search it, Display it, Edit it, Add Records to it, and Save it. The final week will present a machine code printer driver to enable you to list searches to a printer, and will also give you hints to help you get the best out of the programs.

This version of *Tracer* is suitable for use on a BBC B with 40 track drive using the Acorn or Watford single density DFS. It has been checked with Basic 1

and 2, and with OS 1.2. It will run on a cassette system, but the slow program and file transfer rates reduce its value in searching for references.

### Program Notes

The New Index program gets an index name, checks it for uniqueness, and enables you to define the format of the records in your index. It does this by asking you to compose the headings under which the index is later displayed. The number of characters and/or spaces used in each field in the heading become the number of characters allowed in each field of the index.

In order to save memory space, the New Index routine has been separated from the main program and is "chained" into use from disc when it is required. It is loaded into the same area as the main program, and when it has finished it chains Tracer back into position.

**The Listing** – apart from some space-saving constructions which might look odd to those who faithfully follow the conventional usage of BBC Basic, the main curiosity of the listing is the appearance of 'g' and 'y' characters inside quotes due to be printed on screen. These simply refer to the telnet codes obtained by using the shifted function keys. Hence '<SHIFT g>' is green 'y' = <SHIFT f3> is yellow

Line 80 - initialises the main variables used and sets up the error trap. *Hmax* is the start

```

18 REM TRACER, A SUPERFAST INDEX CREATION AND SEARCH PROGRAM
20 REM C.R.WOODINGS (C)1985
30
40 REM NEW INDEX PROGRAM
50
60 REM*****+
70
80 MODE7,HIMEM=82H:IF I$=40:PX=$C00:S$=$C50:PK=$CAB:ONERRORGOTO100
90 PROCChw,GOTO110
100 ?$F=$BD:?'HIMEM=80D:IF ERR=>C3 CLS:PROCrp(12,"This name is in use. Try Again")
101:PROCco(28):GOTO90 ELSE IFERR>17 CLS:PRINTTAB(5,12):REPORT:PROCco(28)
110 CHAIN"TRACER"
120 END
125 REM The 'Y' before <ESC> etc is the yellow teletext code <SHIFT F3>
130
135 DEFPROCt($P$):CLS:$P$=CHR$131+CHR$141+$P$:PROCrp(1,9$P$):PROCrp(2,$P$):PRINT
TTAB(0,3)CHR$145 STRING$(39,""):PRINTTAB(0,22)CHR$145 STRING$(39,""):PROCrp(21
,"YESC$ FOR MENU"):ENDPROC
135
140 DEFPROCn
150 PROC("New Index"):PROCrp(12,"yEnter New Name":PRINTTAB(0,14),":%$=FNm(7
31,97),$P$="&I,"+5%$+"-STR$-HIMEM" +$:X$=0:YS=$C:CALL&FFF7:W$=8
160 $P$="DELETE 1. "+$P$+"-STR$-HIMEM" +$:X$=6:YK=$C:CALL&FFF7:W$=8
170 I$=LEN(HIMEM)<>39:GOTO210
180 PROCrp(12,"yCurrent format 15. -":PRINTTAB(0,14):SPC4:PRINTTAB(0,14):$HIM
EM=82H
190 PRINTTAB(0,15)"1. '5' '5' '16' '15' '28' '28' '25' '30" "35' '39"
200 IF NOT FNm(10)=I$ THEN "I$ is this O.K.":ENDPROC
210 PROCrp(12,"yEnter Record format with Titles":PROCrp(19,"yUp to 7 fields a
re allowed":)PROCco(28,"yUse <39 to end all but last field":)
220 PRINTTAB(0,15)"1. '5' '5' '16' '15' '28' '28' '25" "30" "35' '39"
230 PRINTTAB(0,14):$HIMEM=FNm(39,31,126):PRINTTAB(0,15)SPC4:IF LEN($HIMEM)<
39:PROCPr(12,"yRecord Length must = 39 Characters":PROCco(28):GOTO210
240 fid=$P:fldlen=1:ptr=8
250 REPEAT
260 IF7(HIMEM+ptr)=#47 OR ?(HIMEM+ptr)=#13 THEN? (HIMEM+48+f1d)=fldlen-1:f1dlen=0
:f1d=f1d+1:IF7(HIMEM+ptr)=#47 (HIMEM+ptr)=120+f1d
270 ptr=ptr+1:fldlen=fldlen+1
280 UNTILptr>39
290 N$=39:REPEAT:MX=N$+1:UNTIL$=HIMEM=0:MX=40=f1d
300 IF N$=40-f1d:PROCrp(12,"yZero length field used":)PROCco(28):GOTO210
310 IF f1d>7:PROCPr(12,"yMore than 7 fields used":)PROCco(28):GOTO210
320 ?(HIMEM=47)=f1d
330 PROCPr(12,9HIMEM):PROCPr(14,STRING$(46, ")):IF FNm(14,"Is this O.K."):G
OTO210

```

of the index proper, and *P%*, *S%* and *I%* are the starting addresses of general use string buffers set up to avoid using the Basic string storage method, which consumes useful RAM above the program. *I%* is used as a permanent location for the index name. String variables stored in this way are preserved through the chaining operations.

Line 100 - when *Escape* is pressed or when an error is detected, this line clears any index name from *P%* and any index heading from *Hmem*. Error *C3* is the "file locked" error and is used by *Tracer* to prevent you accidentally using the same index name twice and erasing a valuable index. *Tracer* automatically locks indexes every time it saves them. *Procnw* checks to see whether an index name already exists simply by trying to save a blank file of that name, and if the *C3* error occurs it means that the file does exist. This is much more economical than the routines provided to enable you to read the disc catalogue. Error 17 is *Escape*, and pressing *Escape* calls up *Tracer* without setting up a new index.

Line 130 - calls *Proc* to set up the screen,

gets in your index name, and stores it at *P%* and then sets up a command line at *P%* to enable a blank file to be saved using the command line interpreter which resides at *4FFF\$* in the operating system. As mentioned above this is simply a device to check that the name you chose was unique.

Line 168 - deletes the blank file created by Line 180 in case you change your mind before using it. *Tracer* will only use the new name if you actually put something in the index and save it from the main program.

Lines 178-230 - valid headings have 39 characters. If such a heading is already present, Lines 180 - 200 displays it for your approval. Otherwise Lines 210 - 230 get in a new heading.

Lines 240-280 - sift through your heading counting the number of fields and measuring their length. They put the data obtained in the seven bytes following the heading itself (i.e. from *Hmem* + 40) and replace CHR\$47 (i.e. "/") in the file dividers with a teletext colour code (i.e. 128 + *fd*).

Lines 290-310 - check that you have no zero length fields, and that you don't have more

than 7 fields in total.

Line 320 - loads the number of fields used into the byte *Hmem* + 47.

Line 330 - gives you a chance to change the heading how stored in final form at *Hmem*. If its OK the index length variable *W%* is zeroed at Line 340, and the end of *Procnw* precipitates the chaining of *Tracer* via Line 90.

Lines 360-470 - are the utility procedures controlling keyboard inputs (*Phm*, *Procc*, *Phm*). They use locations *P%* and *S%* to store strings. *Phm* uses parameters *V%* (to control the number of characters accepted), and *hiASC* and *hiASC* (to define the lowest and highest ASCII code keypresses which will be accepted).

Line 480 - *Procpr* ensures that text is centred when printed.

Save the listing under the name "NEW" preferably on an empty disc which can be reserved for the rest of the programs.

If you would like to have the whole series up and running on a 40 track disc, send £12 to the author at 12 Copsewood Ave, Nuneaton, Warwickshire CV11 4TQ.

```

348 WS=0
355 ENDPROC
354
355 REM The 'g' in Line 378 is the green teletext code <SHIFT f2>
356
368 DEFFNyn([US,$P$),LOCALans:="FX15,1
378 PROCCpr([US,"g"+$P$+" (Y/N) ? Y"],VDU8,REPEAT,ans=(GET AND &DF):UNTILans=$P
0Rans=&E ORans=80:PRINTTAB(0,US)SPC70,=(CHR$ans+"M")
375
388 DEFFPROGc([U%):=FX15,6
398 PROCCpr([US,"yRETURN"; to continue "]:REPEATUNTILGET=13:PRINTTAB(6,US)SPC30:
ENDPROC
395
408 DEFFN1m([V%,loASC,hiASC),VDU23,1,1;0;0;:=FX282,32
418 LOCAL K3,25:K=0;75:$D
428 PRINTSTRING$([V%,."}):",STRING$([V%1,CHR$0]):=FX15,1
438 REPEAT:25=GET
448 IF25=127ANDK3>0 K3=K3-1:$5$=LEFT$([$5$,K5):VDU25,46,0;GOT0478
458 IF25>0AND K5>VAND 25<hiASC K3=K3+1:$5$=0$5$+CHR$25:VDU25;GOT0478
458 IFNOT([25=13AND K3>0)VDU7
478 UNTIL25=13AND K3>0:$5$
475
488 DEFFPROGc([US,$P$):PRINTTAB(0,US):SPC39:PRINTTAB({16-LEN$P%}/2,US)$P%,ENDP
ROC

```

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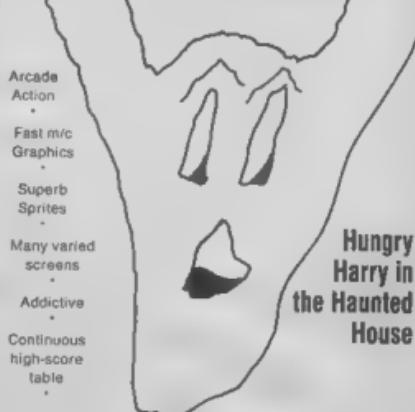
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## Merging mania

The final instalment of a mail-merge program for the QL written by Don McAllister

The normal datafile produced by *Archive* is not correctly formatted to use in this application, so it is necessary to construct a separate file specifically containing the information we require. This has the advantage of being able to extract, for example, names and addresses from a main file of customers, which would normally contain other information, information not required to produce a mailshot. You may also wish only to select a small number of customers using specific criteria for your mailshot. This separate file

of names and addresses can be constructed by using a procedure entered in the *Edit* mode of *Archive*.

Let us presume a simple file has been created using the *Create* command (see figure 1). In this masterfile is contained the name, address, product code (signifying the item sold), date of purchase and first name of each individual customer.

Assuming that you have opened the masterfile using the *Open* command and it is the current file in use, to construct a file containing every address in the

masterfile, we would use the procedure in figure 2. This is entered in the *Edit* mode of *Archive*, and is initiated by typing *mail*.

If we wanted to send details of, for example, new software available, only to customers who had purchased an item with product code 3 (say a QL computer) then we would use the procedure in figure 3. This procedure extracts all those customers and produces a file containing just their names and addresses, and is initiated by typing *choose*.

Finally once both the Quill document and the address file have been prepared all that is necessary is to load the mail-merge program and carefully follow the on-screen prompts.

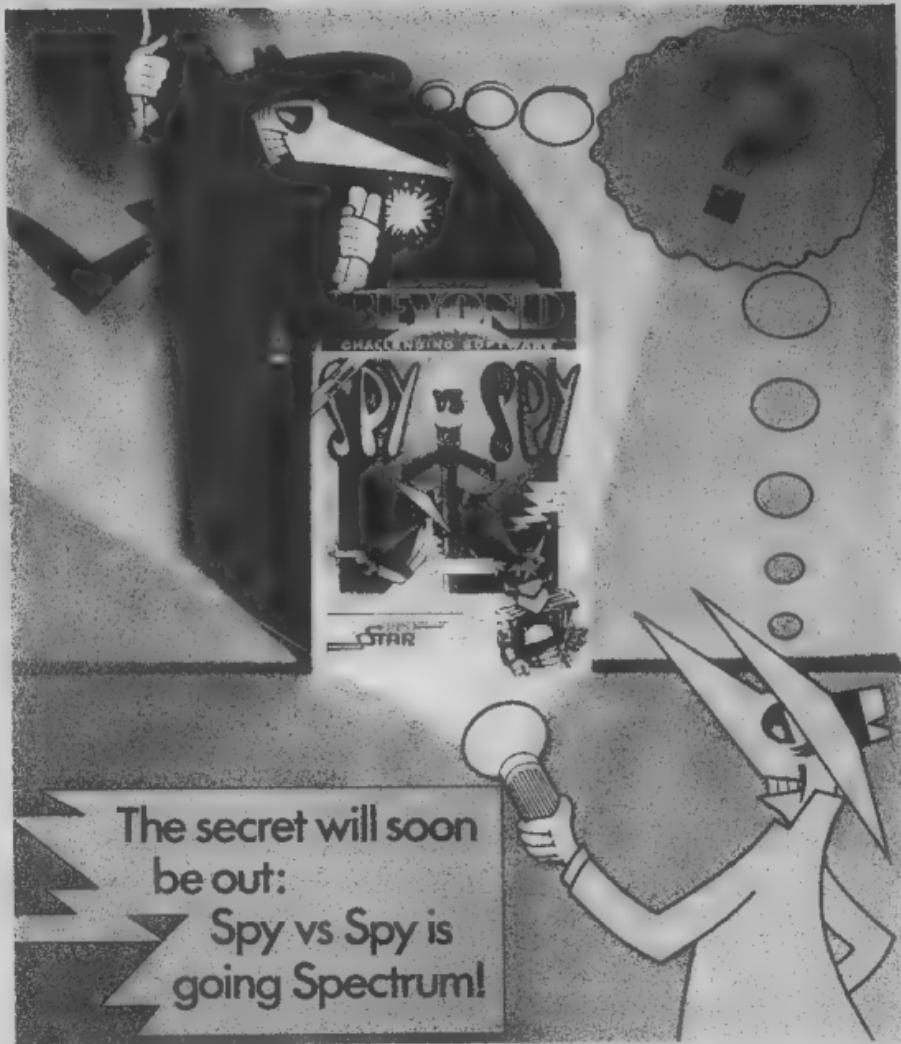
Copies of the program on microdrive are available from the author at 13 Brookside Close, Prescot, Merseyside costing £8.95.

```
1290 CSIZE 2,0:AT 19,0 :INPUT " Ready for print run
1291 (y/n)? :$answer$
1300 IF answer$ = "Y" OR answer$ = "y" THEN
1310   channel=4
1320   dbase = hold_variable
1330   construct
1340 ELSE
1350   file
1360 END IF
1370 END DEFINE
1380 :
1390 DEFINE PRDProcedure address
1400 screen_display
1410 INK 7:PAPER 2
1420 CSIZE 3,1:AT 2,7:PRINT "ADDRESS LIST "
1430 CSIZE 1,0:AT 11,13:INPUT "Print address list ? (y/n)
":$ans$
1440 IF ans$ = "Y" OR ans$ = "y" THEN
1450   AT 13,11:INPUT "Space between each address :
":$space
1460   CSIZE 0,0:PAPER 4:INK 0:AT 17,20: PRINT " To
initiate print run - press f1"
1470 ELSE
1480   help
1490   STOP
1500 END IF
1510 output=CODE(INKEY$(-1))
1520 IF output = 232 THEN
1530   channel = 4
1540 ELSE
```

```
1550    help
1560    STOP
1570    END IF
1580    OPEN_IN 03,'adv\&44' _bfile$ 
1590    OPEN #4,ser1
1600    CSIZE 2,0; AT 17,8:PRINT " PRINTING INITIATED"
1610    tlf_list
1620    REPeat loop
1630    IF EOF(03) THEN EXIT loop
1640    FOR lines = 1 TO gap
1650    tlf_list
1660    prt_line
1670    END FOR lines
1680    tlf_list
1690    FOR separator = 1 ■■■ space
1700    PRINT #4
1710    END FOR separator
1720    END REPeat loop
1730    CLOSE #4
1740    CLOSE #3
1750    INK 7;AT 17,8:PRINT " PRINTING FINISHED "
1760    PAUSE 250;help
1770 END DEFINE
1780 :
1790 DEFINE PROCedure tlf_list: REMark ** Take line from
archive file **
1800 INPUT #3,rec$ 
1810 END DEFINE
1820 :
1830 DEFINE PROCedure tlf_doc: REMark ** Take line from
quill document **
1840 INPUT #5,rec$ 
1850 END DEFINE
1860 :
1870 DEFINE PROCedure prt_lines REMark ** Print line **
1880 PRINT B(channel),rec$ 
1890 END DEFINE
1900 :
1910 DEFINE PROCedure report
1920 position = 10
1930 screen_display
1940 PAPER 2;INK 7
1950 CSIZE 3,0;AT 2,9:PRINT"PRINTING"
1960 CSIZE 1,0;AT 4,9:PRINT"QUILL SOURCE DOCUMENT :"
"lname$"
1970 AT 6,10:PRINT "USING DATA HELD BY"
1980 AT 6,10:PRINT "ARCHIVE DATA FILE : " ;file$ 
1990 INK 0;PAPER 4: CSIZE 0,0;AT 17,18:PRINT "CURRENTLY"
PRINTING DOCUMENT No : " ;document
2000 AT 18,23:PRINT "(dbase=document)" DOCUMENTS LEFT ■■■
RUN"
2010 END DEFINE
2020 :
2030 DEFINE PROCedure report_update
2040 CSIZE 0,0
2050 INK 7;PAPER 2
2060 AT position,24:PRINT rec$ 
2070 LET position=position+1
2080 END DEFINE
2090 :
2100 DEFINE PROCedure help
2110 CSIZE 3,0
2120 PAPER 2;INK 7;CLS
2130 AT 2,8: PRINT"INFORMATION"
2140 CSIZE 0,0
2150 LINE 10,75 TO 150,75 TO 150,30 TO 10,30 TO 10,75
2160 AT 6,8:PRINT "TO RE-RUN PRINTING WITH CURRENT DATA -"
TYPE 'CONSTRUCT'
2170 AT 8,8:PRINT "TO RE-RUN ADDRESS LIST PRINTING -"
TYPE 'ADDRESS'
2180 AT 10,8:PRINT "TO RESTART PROGRAM WITH NEW DATA -"
TYPE 'START'
2190 AT 12,8:PRINT "TO RETURN TO SUPERBASIC -"
TYPE 'NEW'
2200 END DEFINE
2210 :
2220 DEFINE PROCedure layout
2230 FOR record = 1 TO n
2240   tlf_doc
2250   prt_line
2260 END FOR record
2270 END DEFINE
```

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## Sound electronics

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by Gareth Thomas*

by **Garrett Thomas**

This program acts as a utility for designing sound effects on the 64. Because all values used and displayed by the program are those that need to be *Poked*, conversion of sounds to your own programs is easy.

For a Basic program it provides a good coverage of the sound capabilities of the 64 including: synchronisation, ring modulation, filtering, resonance, ADSR, waveform selection, multiple voices and filter sweeping. All information is displayed on one screen with selection being made on the bottom line via four different one line menus.

A window at the bottom left displays prompts while the next window along is used for input.

When the program is run the bottom line should look like this: F1-Define, F3-Effects, F5-Voice, F7-Sound. All the main sound features, ie, ADSR, waveform and filtering, are available by pressing *F1*, so if pressed the bottom line should now change to look like this: F1-Envelope, F3-Wave, F5-Filter, F7-Exit.

Pressing **F7** will take you back to the main menu. To change the envelope press **F1**. The word envelope should then change to reverse video and the prompt should flash. To change the envelope use one of the prefixes, is, ADSR, and a value between 0-15. So "A15" (return) will set the Attack to 15 and "S4" (return) will set the Sustain to 4. Once you have finished type **esc**.

4. Once you have finished type "E" (return) to exit back to the menu.

To change the waveform press **F3**. There are all four waveforms to select from; Triangle, Sawtooth Pulse, Noise. To select type the prefix (ie. **T** for triangle) etc. If you select Pulse you must then enter the pulse width, this takes the form of high and low values with H between 0-15 and L between 0-255. To change these type the prefix followed by the value, eg "P" (return), "H15" (return), "L255" (return), "E" (return) exit back to menu. This will set up pulse waveform with maximum width.

Finally to set up the filter press F8. First enter the filter type, High pass, Low pass, or Band pass. Again use the prefix to select.

Next you are prompted for the cutoff point, taking the form of High(H) and Low(L) values. H is in the range 0-255 and L is the range 0-7. Next week we go on to the filters.



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## Timer on Amstrad

This programme will test the reactions of all CPC 464 owners. Both eyes and ears are tested so make sure the volume

control is turned well up!

The program is fully documented with Rem statements.

```
10 RANDOMIZE TIME
20 DIM t(10)
30 PAPER 0:OPEN 1: MODE :
40 PRINT "This program tests your reaction time"
50 PRINT "The first test is for your eyes, next your ears and then mixed."
50 PRINT "With the eye test there will appear a yellow square somewhere on the
screen. You then press a key or a fire button as fast as possible"
70 PRINT "Every time there will be ten tests. Between each test you also press a key or a fire button"
80 PRINT "Your average will be calculated"
90 PRINT;PRINT "copyright A.C.Karsten 1982"
100 PRINT;PRINT "press any key"
110 150 INKEY$;IF i="" THEN 110
120 CLS
130 BORDER 16
140 WINDOW 0,1,40,20,25:WINDOW $1,1,40,1,19
145 REM set up string for square
150 a$=CHR$(143)+CHR$(143)+CHR$(10)+CHR$(8)+CHR$(8)+CHR$(143)+CHR$(143)
150 PAPER 0,3: PEN 0,-2
170 FOR u=0 TO 9
180 CLE
185 REM randomise waiting time between 1 and 11 seconds
190 g=INT(RND(1)*10)+1+TIME
195 REM for full explanation of time variable see handbook page 48,51
200 g2=TIME: j=INKEY$:IF j<>"" THEN PRINT "To early!":GOTO 190
210 IF ((g2-g)<300)<g THEN 200
220 x=INT(RND(1)*25)+1:y=INT(RND(1)*15)+1
230 LOCATE 11,x,y:PRINT b1,AS;:i:TIME
240 150 INKEY$:IF i="" THEN 240
250 t(u)=(TIME-g)/300
```

## The Music Box



### Step-time

I've received a letter from the delightfully named Edward Primrose of Paris. Yes, *Music Box* is an international column! M Primrose writes that he is "absolutely tantalised by the Allen & Heath Brenell products" I mentioned in a recent column. He asks for more information.

I'll be sending Edward's query on to Allen & Heath Brenell, but in case any other readers would like to know more about these items, here's a brief reminder:

The CMC Mixer was launched in 1984 as a self-contained, microprocessor controlled sound mixer. A&H introduced the CMI64 and CMS64 add-ons at the Frankfurt Music Fair. The CMI64 is an interface to link the mixer with a Commodore 64. This allows indexing by channel and track, route paging and sequencing (2048 events). The CMS64 extends the sequencer facility, allowing generation of SMPTE tape time code and syncing to the code or to an external drum machine.

This kit won't come cheap, but the spec looks impressive. Allen & Heath Brenell can be contacted at 89 Ship Street, Brighton BN1 1AE (tel: 0273 24928).

Also for the Commodore is the Joreth Music Composer System from Joreth Music, who can be contacted on 0386 831618. This is a MIDI sequencer package but, appar-

ently, with a difference. The difference is that the Joreth supports sequencing in real-time, step-time or a mixture of the two. The step-time software also includes a routine for displaying scores on screen or dumping them to a Commodore MPS 801 (or equivalent) dot-matrix printer.

The program is supplied on disc only and, obviously, includes full disc filing and all the regular MIDI sequencer features. An unusual - and welcome - touch is the inclusion of a facility allowing the syncing of input and output events to triggered equipment using standards other than MIDI: drum machines, sequencers and SMPTE coded tape, for example. All-in-all, it sounds highly impressive.

Meanwhile, owners of the BBC computer may be interested to hear of another synthesizer/sequencer package

using the BBC's internal sound chip and QWERTY keyboard to generate all the sounds. The package is called *Music Maker* and comes from FSoft, PO Box 382, Brighton BN1 3AY (tel: 0273 736042). It's priced at £9 and supports all the usual features plus on-screen score display during sequencing, the ability to mix up to three tracks and a rhythm track in real-time and full editing of sequences.

Gary Herman

*The Music Box* is a weekly column with news, reviews and readers' comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to: Gary Herman, *The Music Box*, 12-13 Little Newport Street, London WC2R 3LD.

# Open Forum

```

260 PRINT"reaction time";:PRINT USING "##.##";t(u)
270 i$=INKEY$:IF i$="" THEN 270
280 CLS#1
290 NEXT i
300 CLS
310 t1jd=0
320 FOR x=0 TO 9:t1jd=t(x)+t1jd:NEXT x
330 t1jd=t1jd/10
340 PRINT"The reaction time of your eyes is:";:PRINT USING "##.##";t1jd
345 REM next block for the ear test
350 PRINT"Now for your ears"
360 i$=INKEY$:IF i$="" THEN 360
370 FOR u=0 TO 9
380 CLS
390 g=INT(RND(1)*10)+1:g1=TIME
400 g2=TIME:i$=INKEY$:IF i$<>" " THEN PRINT"To early!":GOTO 390
410 IF ((g2-g1)/300)<g THEN 400
420 PRINT"1,CHR$(7):t=TIME
430 i$=INKEY$:IF i$="" THEN 430
440 t(u)=(TIME-t)/300
450 PRINT"reaction time";:PRINT USING "##.##";t(u)
460 i$=INKEY$:IF i$="" THEN 460
470 NEXT u
480 CLS
490 t1jd=0
500 FOR x=0 TO 9:t1jd=t(x)+t1jd:NEXT x
510 t1jd=t1jd/10
520 PRINT"The reaction time of your ears!";:PRINT USING "##.##";t1jd
525 REM next block for the mix test
530 PRINT"Now a combination of both"
540 i$=INKEY$:IF i$="" THEN 540
550 CLS#1
560 FOR u=0 TO 9
570 CLS#1
580 CLS
590 g=INT(RND(1)*10)+1:g1=TIME
600 g2=TIME:i$=INKEY$:IF i$<>" " THEN PRINT"To early!":GOTO 590
610 IF ((g2-g1)/300)<g THEN 600
620 i$=INT(RND(1)*55)+1:y=INT(RND(1)*5)+1
630 IF RND(1)<0.5 THEN PRINT "#1,CHR$(7) ELSE LOCATE #1,x,y:PRINT #1,a$,
640 t:TIME
650 i$=INKEY$:IF i$="" THEN 650
660 t(u)=(TIME-t)/300
670 PRINT"reaction time";:PRINT USING "##.##";t(u)
680 i$=INKEY$:IF i$="" THEN 680
690 NEXT u
700 CLS
710 FOR x=0 TO 9:t1jdg=t(x)+t1jdg:NEXT x
720 t1jdg=t1jdg/10
730 PRINT"The reaction time of eyes/ears!";:PRINT USING "##.##";t1jdg
740 PRINT"The reaction time during the test!";:PRINT USING "##.##";(t1jd+t1jd+1),
750 PRINT"Another TEST? then press space"
760 i$=INKEY$:IF i$="" THEN 760
770 IF i$="" " THEN RUN

```

TUNER  
by A Karsten

## Book ends



**Book** *The Which? Software Guide* **Price** £1.96 **Author** Mervyn Morris **Supplier** Consumers' Association **Address** 14 Buckingham Street, London WC2N 8DS

**O**h no, thought I, a well meaning guide to software - the epitome of the pine scatter cushion set. The games section reinforced this prej�dice; games don't give themselves to the rational standards of the Consumers' Association.

Games also tend to be short lived, with a few notable exceptions, and well reviewed by the specialist press, despite the introduction's assertion to the contrary. Then I reached the review of business programs and after that computing aids, education and household. These groups are far less often reviewed and have perennial appeal.

Though it's not perfect, all the major micros are catered for by this software equivalent of the Good Food Guide. Fast food freaks won't find of much use, but it should help the older, less experienced eater avoid indigestion.

John Minson



**Book** *Interfacing the BBC Microcomputer* **Price** £7.95 **Author** Michael R. Beale **Supplier** Macmillan Higher and Further Education Division, Houndsdown, Basingstoke, Hants RG21 2EB.

**T**he BBC is often thought of as an experimenter's computer and the 150 pages of this book bear that out. It calls for knowledge of Basic programming, the workings of machine code and electronics, plus the ability to comprehend much highly concentrated

information.

From this base it discusses the concepts of data transfer, and introduces the 8-bit parallel user port, the 1MHz bus and analogue to digital conversion. The final chapter presents a range of practical applications, complete with circuit diagrams and listings. There are also five appendices, including data sheets and a summary of connections, plus an index.

A book, therefore, which tackles a difficult subject in a knowledgeable, no-frills fashion, suitable for those who already have a firm technical grasp of computers.

John Minson

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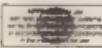
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## Loose ends

This week I want to clear up one or two loose ends so let's begin with the password for the game *Spectacles* that accompanies Design-Design's *Dark Star*. Following a request for someone to hack it, I was inundated with replies, especially after one of the monthly mags printed the answer. But even before that, it seems to be one of the worst kept secrets in history and I don't know why no one bothered to send it in before. My thanks go to everyone who wrote in, and especially to Mike Beasley who even went so far as to ring up. The answer is 'Everyone's a nervous wreck' but since so many people knew that there can be no prizes for revealing it.

As to what the game is about, here is a summary from the first ■■■ write in, Michael Banbrook of Streatham. "I must congratulate Design-Design on an excellent send up of teletext, a sort of computer *Spitting Images*. They take the wicked mickey out of your rival magazines, especially C&VG, Keith Campbell, Ultimate, MSX and their own programmers. My main criticism is the language which has some explicit swearing (whatever you do, don't let your parents see it)!"

Mike's letter was one of the most enjoyable we've had and he goes on to give us some tips for Microsphere's superb *Skool Daze*. "If you stand behind Mr Within on the left hand side of the classroom he won't see you to give you lines. Here are the history dates that Mr Creak asks you - Londanus 1571, Yorktown 1781, Flodden 1513, Shrewsbury 1403, Poiters 1356, Hastings 1066, Evesham 1265, Lexington 1775, Borodino 182, Balaklava 1854, Trafalgar 1805, Sedgemoor 1685. Also, on Melbourne House's excellent adventure *Sherlock*, try typing Call 22

(apologies to Tony Bridge for slipping this in here). Can anyone tell me how to do screen dumps to an Alphacom 32 with the Ocean games protected by Speedlock? I would also greatly appreciate tips and *Poke* from Mastertronic's *Finders Keepers*.

"My worst buys are *Designer's Pencil* by Activision, the Spectrum version of *Ghostbusters*, *The Dungeon Builder* by Dream Software (help! - can anyone work the graphics facility?). *Combat Lynx* by Durell is not bad but has far too many keys. My best buys are *Skool Daze* - addictive and cheap, *Finders Keepers* - the best cheapo yet, only £1.99, addictive, brilliant and excellent value (Mastertronic are getting good), *Go Go the Choc* by Firebird for the Commodore - only £2.80 and really good (please do a conversion for the Spectrum)!"

Thanks for your comments and I hope to hear from you again, Mike. I agree about both *Finders* and *Go Go* - given the quality at those prices you would have to be barking mad not to buy them and I hope to see them both in the charts very soon.

Now then, I did promise to print the routine necessary to get the infinite lives *Poke* into *Knight Lore*, courtesy of Barrie Collins of London. "Save this listing to tape, position *Knight Lore* just past the initial header and run the new program, start the tape and everything should happen automatically."

10 *Clear 24831: Restore : Gosub 60 : Poke 620000,81 : Poke 62178,0 : Poke 62238,201*

: *Poke* 62410,251 : *Poke* 62411,201 : *Randomise USR* 62374  
20 *Poke* 53567,0  
30 *Print Usr* 24832  
40 *Data* 23296, 23309, 221, 33,  
64, 156, 17, 14, 4, 82, 285, 55,  
205, 98, 5, 201  
50 *Data* 41012, 41021, 33, 113,  
158, 17, 48, 242, 1, 172, 1, 175  
60 *Read a,z* For p-a To z:  
Read d: *Poke* p,d : *Next p*:  
*Randomise Usr* : *Return*

Whilst on the subject I'd like to congratulate Colin Gardner of Crawley for finishing *Knight Lore* (74% 38 days), Philip Moore of South Ruislip for finishing *Underworld* (28%) and Tsouranakis Paraskevas ■ hope I've got your name right) of Greece who has finished both and given us these tips on some important locations. "If you mark the top left of the map as 1,1 the exits are ■ 1,4; 1,10; and 1,14. The start location is at 18,10. The weapons will appear in one of these positions for sword, bow and club respectively - 17,11; 20,6; 9,12 or 17,15; 25,2; 18,7. or 19,14; 11,7 or finally 18,11; 12,16; 23,9.

Let's stick with Ultimate for the moment but move on to their Commodore game *Staff of Karnak*. Darren Riley of Barrow in Furness has collected nine of the ■■■ pieces of the pentacle and wants to know how to get those on the bed, in the cobweb and in the library.

"I have found uses for Knossos to lift up the snake, Aeolus to put out the fire in the great hall, Stoly stops the electric door and Ibrahim momentarily paralyses the big monsters in the dungeons." Well, Darren, I'm

sure that you have noticed the rug on the floor of the timeless room, where the piece is on top of the bed, which is of course the flying carpet mentioned on the cassette cover. I expect you've also tired using all of your spells on it as well, but the trick here ■ one of position. Firing the correct spell from the doorway on the left will cause the carpet to ripple and if you, quickly, walk to the back of it you will be lifted up.

Incidentally, the timeless room literally makes your 'time less' at a frightening rate while you are here, which is the main reason that games don't really last six hours, so it pays to be quick if you can't avoid this room. Other room names also give a clue to how to solve them and the waiting room in particular should be taken literally.

As for the library I don't know, but considering the amount of energy lost when passing the suits of armour to get to it, and considering the impossibility of passing the skeleton when you collect the piece, perhaps there is a hidden door that will let you escape into an adjacent room. Remember that secret compartments are also mentioned on the cover. Answers please someone!

Darren goes on to tell us that he has scored 108,000 dollars on the Commodore *Ghostbusters* (account number 00321204). Also "on the Spectrum game *Brian Bloodaxe* I can use the spade for digging through certain platforms but I don't know what to use the sword on". Can anyone reveal all?

Tony Kendle

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Between now and September Tony Kendle will be keeping you up to date on the *Arcade Avenue* page with just who has the scores to beat. Then, in September, the top three scores on each machine will battle it out for a place in the final and the chance to be the first to play our 'top secret' game.

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Game 3 Shoot the English	Charlie Egg	Cyclone	Manic Miner

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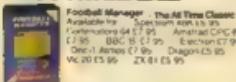
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## Male conventions

**T**he next time that you are engaged in a healthy hack 'n' slash, listening with relish to the crack of orc-skull, and generally wallowing in the usual masculine macho blood-and-guts to be found in the average adventure, spare a thought for those of us who find this rather offensive. A letter from Ms Suzi Yarn of Dudley raises an interesting point: 'I am writing to complain about adventure programmers. When I buy a new adventure, I always find that my character is "the Hero". Why in these fantasy games do the normal (?) sex rules apply - why is it only men or male characters that are the control characters? Imagine if every game you played forced you to be female. Think about it. All we gamers are doing is saving the world from darkness or picking up treasures, so rules of "women as prizes" shouldn't apply. Please, programmers, you are writing games for all of us!'

Two years ago, in the mists of time, the Adventure Corner covered this very point, in talking about *Love*, an adventure from Remsoft that disappeared. I'm glad to say, without leaving a ripple on the adventure pond. This game went completely the other way and cast the player in the role of a helpless female, who, believe it or not, actually had to strip off (in the game, that is) to complete the adventure! As with *Love*, and the equally awful, but more recent efforts from CCS (the Adventures for Girls), the result of consciously attempting to aim story lines at female players is merely embarrassment. Frankly, I'd rather software writers didn't bother, but instead just ignored the whole problem.

Andrew Kershaw of Hull writes: 'I have been playing *Adventureland* - the graphics are superb. I was doing quite well until I reached the deep chasm and tried to get the object from the lava. Any ideas? And also, how do I go about getting the Scott Adam's Book of Hints?'

*Adventureland* is a program that started it all off, at least on the home micro - it took a little while longer for the original 'Classic' Adventure to make its way from the mainframe computers to the micro. And as such, it should command our proper respect - even after all these years, it is still a great adventure.

Now, to get the object from the lava, you must first of all get some fire bricks. You'll have seen the bricked-up window, and you must approach it from the Royal chamber. Carry these, very carefully, down to the lava, and then drop them to form a dam. The lava will eventually cool down, leaving the object of your desires to be collected. As the Book of Hints, which are mostly very cryptic (although there are one or two out-and-out solutions), it has been rather difficult to get hold of, but now Adventure International is supplying retailers with Scott Adams Adventure Centres. These will be kept stocked up with all the adventures (including the mostly excellent Channel 4 games) together with the AI programs, like *Preppie* and *Diskey* - and the Book of Hints.

Speaking of Adventure International, some news of upcoming adventures from them. The Scott Adams machine rolls on, sweeping all before it, with Questprobe 3 coming up in April or May. This is *The Fantastic Four*, which will, in the first instance, feature The Human Torch and The Thing as your alter egos.

Brian Howarth, whose name will be well-known from the Channel 8/Mysterious Adventures series, is now working for Adventure International, and his new programs, due now, are *Midwinter*, *After The Fire and Beyond the Infinite* - 'available soon' is *Through the Enchanted Mirror*. I haven't seen any of those, but, as I've pointed out before, Howarth's titles are always very evocative, and that is 80% of the battle won.

Artic have recently released a new adventure, called *Dead at the Controls*. Written by Dave Stone, this is a very stylish adventure which kept me slaving

over the hot Spectrum for hours. The character set is redesigned into an Amstrad-looking style, with serifs - why do Spectrum authors have to make the machine look like every other machine but the Spectrum? Descriptions and text input take up the lower two-thirds of the screen, with some lovely graphics in the top third. It's all a bit untidy, though, with the graphics and text gradually scrolling up the screen and disappearing with more input. There is also no provision, that I could find, anyway for turning the graphics off.

Once into the game, however, these drawbacks don't matter too much. You are Captain Ferret (well, of course you are) and you're circling a strange planet when horrors of horrors, your trusty ship is knocked out by their defence system. Your escape promptly explodes, leaving you to parachute slowly to the surface.

There are plenty of Red Herrings, and only one or two of the objects to be found actually help in any way. But there is a calculator this you should *Press* and then *Examine*. Free clue over, this will get you into the next round of locations, and will be very useful throughout the adventure, different numbers having different effects. In general, the program works well.

*Dead at the Controls* is a welcome program from Artic - it's not extremely difficult, but has a lot of humour and a lot of Red Herrings, which will keep you knocking at many a wrong door! With *Curse of the Seven Faces*, mentioned in this column more than once, Artic have come back into the adventuring fold at last. They were, after all, one of the very first pioneers in Britain and still retain a cherished position in the hearts of any ex-ZX81'er.

Saturday 16 March saw the official opening of the Adventurer's Guild. Crowds of would-be adventurers gathered in darkest Gravesend for the event, including many regular correspondents and readers of this page.

The brainchild of Ken Matthews and his partner John Miles, the Guild is the latest retail outlet for chess machines, computer hardware, and role-playing modular games as well as adventures.

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This series of articles is designed for novices and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure you cannot progress any further write to: Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

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**SPECTRUM BOOK LIBRARY**. Send SAE for details to P. Lavender. Dept. PC, 27 Myl-Y-Cred, Radyr, Cardiff CF4 8AO. **SHARP MZ-80A** 48K RAM. Integral monitor and cassette recorder and full travel keyboard. Lots of software including Pascal, assemblers and mind games you would like £250 onto Tel: (0522) 504431.

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## ADVENTURE

## HELPLINE

**Mountains of Ket** on Spectrum. How do you find the hat, pass the skull and enter the cave at the rear of the lake? Brian Forbes, 96 Walker Road, Torry, Aberdeen AB1 3ER.

**Sherlock on Commodore 64**. Keys to Basil and Tricia's B&B? Where is the opium den? Who do you ask about the old mill road? Stuart McCabe, 30 Upperway Road, Currock, Carlisle, Cumbria.

**The Stolen Lamp** on BBC. I cannot get started at all. Plummer, 302 Langland Road, Netherfield, Milton Keynes MK6 4HY.

**Velver's Lair** on Spectrum. How do I make the hungry looking sharks into 'placed looking sharks'? They ignore everything. R. Foster, 88 Glenfield Way, Glenfield Park, Plymouth.

West on QL. Is there anything special about the small bedroom? What memory under which boxes? John Bows, 1 B Leanders Court, Beddington, Oxford OX7 6XR (Kingham 682).

**Sherlock on Spectrum** MK. How do I get into Tracy Fander's house in Portman Street? R. Travis, 8 Bar Lane, Staincross, Barnsley, W. Yorkshire, S75 8DQ.

**Fantasia Diamond** on 48K Spectrum. Unable to open musical door, broken door, rusty door, etc. Beyond window in castle. Chris Goldthick, 32 Millbrook Road, East Shirley, Southampton, SO1 0HY.

**Forest at World's End** on Amstrad CPC 464. I can kill the dragon at the precipice. What next? Stephen Riley, 65 Walton St, Shawlands, Glasgow. **Fantasia Diamond** on Amstrad CPC 464. How do I get the golden eagle? I have got everything else, but can't ever find it. Terry Crowe, 26 Blackhorse Cres, Amersham, Bucks. West on Sinclair QL. How do I move the boxes and how do I get across the stonewall? Ian Carman, 4, Bannister St, Witherslack, North Yorkshire.

**Knight Quest** on the Spectrum 48K. How do I get past the recent ice fall which blocks the path? Tomlin, 220 Marlborough Road, Romford, Essex.

**Isle of Babylon** on Amstrad CPC 464. I have found a secret entrance in castle past sleeping pirate. How do I open the door? Graham Neatman, 65 Mill Lane, Clewer Village, Windsor, Berks.

**Underworld** on Spectrum 48K. How do I get round the Horned Guardian at 18 (not? Please! Paul Coyle, 35 Chapel Hill, Clayton West, Huddersfield, West Yorkshire.

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# New Releases

## WINNER

The Enterprise, like most new computers, has quite a few programs which are not entirely wonderful.

On the other hand it does have *Fantasia Diamond* which was a pretty good graphic adventure on the Spectrum.

Graphically it isn't going to make anyone gasp at the Enterprise screen display, being mainly simple chunky pictures. We're going to have to wait a little longer to see what the machine is really capable of.

On the other hand the actual text adventure part is very good. The *Fantasia Diamond* has been stolen and it's up to you to get it back. There are pseudo-independent characters, who don't sing about gold, but can be as unhelpful as Thorin ever was, there is also a mysterious gnome whose casting of his fishing rod seems to have a strange significance.

The Enterprise text display is pleasing on the eye and in all this is a winner.



Not technically shattering, agreed, but above the usual level of first programs for a new machine.

**Program** *Fantasia Diamond*  
**Price** £7.95  
**Micro** Enterprise  
**Supplier** Enterprise  
 31-37, Hoxton St  
 London N13 5TN

## COLOSSAL DRAGON

The dreaded *Colossal Cave* adventure is here yet again. This creaking opus has been around since computer time began and, although tweaked with here and there, remains essentially unchanged. Its longevity is explained partly by reverence for its venerable stature and partly by the fact that it remains one of the most difficult adventure challenges of all.

The latest version is for the Dragon 64, which was not a very successful machine, but has much to recommend it if you accept the limited amount of software for it (excluding Dragon 32 compatibility, of course) - for one thing it's very cheap these days, if you can find it.

Compusense, well known for a range of serious utilities for the Dragon machines as well as peripherals, has issued this *Colossal Cave* variant on disc with a brief sheet of instructions and have included a save/load option which is vital (but missing in some versions).

Don't buy it for technical innovation, the language analysis is pretty simple - there are no graphics either. Buy it because you regularly crack the *Times* and *Guardian* crosswords in under

three minutes and are looking for a new challenge.

**Program** *Colossal Cave*  
**Price** £9.95  
**Micro** Dragon ■■■  
**Supplier** Compusense  
 POBox 169  
 286D Green Lanes  
 London N13 5TN

## COSMIC SPELL

Chaos, magic and death on the plane of Limbo ■ the homely title of the latest offering from Games Workshop. It is a wargame wherein two or more sorcerers pit their wits



and cosmic forces against one another. The art of the game is the selection of the most effective spell to meet each new problem; there are an amazing number of them, each with subtly different properties.

In fact, *Chaos* ■ pretty much a pure strategy game - very much based on the Dungeons and Dragons derived board games except that the computer does all the calculations and each spell is coloured and animated.

The big advantage is that you can play against the com-

puter which will select its own spells for attack and defence and can be instructed to play at various levels of skill. Don't think of this game in terms of an adventure, but instead as a clever wargame with nice effects. I think you'll rate it highly indeed.

**Program** *Chaos*  
**Price** £7.95  
**Micro** Spectrum  
**Supplier** Games Workshop  
 27/29 Sunbeam Rd  
 London NW10 6JP

## HIGH RISE

Activision have been coming up with some nice games for the Commodore recently, and *Rock 'n' Roll* is well up to par with them. Your task, as well animated steampunk sprite, is to fix into place screens of moving girders (sometimes to a pre-determined pattern) to proceed to the next construction level - there being 100 in all.

If this doesn't sound too impressive, then worry not, as the action continues to the best computer generated music since *Ghostbusters*.

To put a competitive slant on the proceedings, you earn money for each girder fixed... but are charged for each you have to unfix afterwards - an all too common event unless your IQ registers well above the Richter scale.

I don't know about you, but I found it... well... riveting.

**Program** *Rock 'n' Roll*  
**Price** £10.95  
**Micro** ■■■ Commodore ■■■  
**Supplier** Activision  
 15 Harley House  
 Marylebone Road  
 London NW1 5HE

## This Week

Program	Type	Micro	Price	Supplier	Web Dimension	Arc	Commodore 64	£10.99	Activision
Amasprite	Ut	Amstrad	£14.95	Cable	The Living Body	ED	Commodore 64	£19.95	Martech
Sub Strike	Arc	BBC	£6.95	Tomorrow's Dm	Splitfire 40	■	Commodore 64	£9.95	Mirrorsoft
Micro Trader	Ut	BBC B	£20.00	Meadow	The Music Studio	Ut	Commodore 64	£14.95	Activision
BBC B Mathematics	Ed	BBC ■	£19.95	QEP	Boardello	■■■	Einstein	£12.95	Bubble Bus
Gremlins	Ad	Commodore 64	£9.95	Adventure	Mans	S	Einstein	£14.95	Tatung
Master of the Lamps	Ad	Commodore 64	£10.99	Activision	Graphic Designer	Ut	MSX	£14.95	Cable
Quasimodo	Arc	Commodore 64	£9.95	US Gold	Spreadsheet	Ut	MSX	£29.95	Kuma
Rock n Roll	Arc	Commodore 64	£10.99	Activision	Sprite Editor	■■■	MSX	£7.95	Cable

# New Releases

## ON THE PISTE

Richard Shepherd Software has produced its first non-adventure title - and it's a goodie.

It didn't seem like it though. I mean *Ski Star 2000* is not the sort of title to encourage optimism. But this is a siding game unlike any other, graphically it looks like a cross between a flight simulation program and Macintosh Icons.

Previous skiing programs have consisted of a birds-eye view of a little figure in a white landscape which scrolls from top to bottom of the screen.

Instead, in *Ski Star* you get a goggle-eye view and have to control your movement by leaning left and right as the ski course scrolls past you. The line graphics look a little like 3D *Battlezone*, growing from the far distance as you approach them.

There are hills, trees and other obstacles to avoid as you also try to steer yourself between left and right flags. And it's not easy.

However one of the best features is the way, using an icon menu system, you can define your own course and set your own hazard levels. Course design consists of shunting little hill and flag shapes around a plan of the contest (this tends to obliterate the view from your goggles and thus makes the whole thing that much more difficult).

It's easy to use, easy to redefine and easy to grasp the basic principles of dealing with it - but it can be fiendishly difficult to play well. Even if the idea of a skiing program

fills you with boredom don't pass this one up - it's original and excellent.

Genuinely inventive.

### Program *Ski Star 2000*

Price

£7.95

Micro

Spectrum

Supplier

Richard Shepherd  
Elm House  
23-25 Elmshorn  
Lane  
Cippenham  
Slough  
Berks

## SUB-STANDARD

Tomorrows Dream Software has recently released a couple of pretty decent machine code utilities. Now we get the company's first arcade game, *Sub Strike* for the BBC.

It's pretty bad actually. *Sub Strike* proves to be a very simple dodge and blast game where you move a little submarine around trying to blast waves upon wave of helicopters whilst dodging their missiles, depth charges and, on later levels, sub-seeking rocks.

It's one of those games that was probably a reasonable sized hit in the arcades three years ago and now you can't remember what its name was. Technically, it's at best workmanlike, as a game it's dull. It even plays a horrible sea shanty each time you start, although thankfully there is an option to turn the sound off.

### Program *Sub Strike*

Price

£6.50

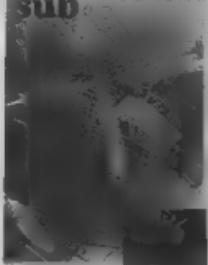
Micro

BBC

Supplier

Tomorrows Dream  
Richmond House  
1B Sydenham Road  
Bristol BS6 5SH

## sub strike



## BANANAS

A quick one. One of the first Enterprise titles to be made available is *Dictator*, one of my favourite strategy games of all time.

The idea is to run a small banana republic with the sole objective of staying in power as long as possible.

Staying in power means playing off landowner against peasant, army against secret police and every other permutation. At the same time you try and salt away treasury funds into your Swiss bank account and buy an escape helicopter if things get tough.

Its devious, original and very funny and still (two years after the Spectrum version first came out) entertains me no end.

### Program *Dictator*

Price

£7.95

Micro

Enterprise

Supplier

Enterprise  
31-37 Hoxton  
Street  
London N1

## ENDURANCE

Einstein software is improving, although there is still a big problem with price - simply because it always comes on 3½" floppies. The latest title is *Le Mans* and has been written for the machine by Electric software.

It is, inevitably, a road race game; you try to steer your turbocharged racing car around a track that scrolls towards you and try to dodge the other cars on the track. In fact, it's more or less *Pole Position*.

Graphically, it looks pretty good, the scrolling is neat, the sound effects are loud and pretty impressive and all in all it matches up pretty well to, say, a Commodore 64 equivalent. If I have a complaint it is that the game is actually extremely difficult to play, I could find one person who didn't crash within the first few moments. Obviously, skill has to be acquired but it could put newcomers off.

The other problem, as I indicated, is the price. I reckon something similar on the Commodore 64 would cost around £7.95 and that price difference is the kind of thing that is not going to help sell Einsteins. Nevertheless, if you have one and want a game that's definitely a step up from previous Einstein programs this is worth looking at.

### Program *Le Mans*

Price

£14.95

Micro

Einstein

Supplier

Tatung  
Stratford Park 10  
Telford  
Shropshire

## This Week

Printer Dump	Ult	GL	£9.95	Posi-Tron
Gremline	Ad	Spectrum	£9.95	Adventure Int
CS Clive	Arc	Spectrum	£1.99	Scorpio
Komplex	Arc	Spectrum	£9.95	Legend
Ski Star 2000	Arc	Spectrum	£7.95	R. Shepherd
Spectrum Matr math	Ed	Spectrum	£6.95	OEP
The Living Body	Ed	Spectrum	£19.95	Maritech
Grand National	S	Spectrum	£8.95	Elite
Strip Portion	■	Spectrum	£1.99	High Voltage

Thermo Nuclear War	S	Spectrum	£5.95*	Zircon
Interface	Ult	Spectrum	£40	Evesham Micro
Leonardo	Ult	Spectrum	£14.95	Creative Sparks
Communic with View	Ult	Tatung	£39.95	Kuma
Cave Fighter	Arc	Vic 20	£5.95	Bubble Bus

Key: Ad - adventure. S - strategy-simulation  
Arc - arcade. Ult - Utility  
Ed - education.

## RENAISSANCE MAN

Leonardo from Creative Sparks is no ordinary graphics designer package. It is to GDP what Rolls Royces are to Anglias or *Manic Miner* is to *Furtive Freddie*. In other words it is very very sophisticated indeed, a 100 page booklet, worth of sophistication.

To state the obvious first, you can draw in several colours in a 'brush-width' that goes as small as a single pixel. It has fill, arc, straight line, draw, circle, etc, etc, and you can save your creation on tape. So what's new?

A lot is new. For example, one important concept is that of recursion, this means that anything you create by way of shape can then be used as a feature of the program to more shapes. To give you an idea of how this works - suppose you create a rectangular 3D line shape, this can then be used as an integral object that can be painted on screen so you can create a screenful of boxes.

It doesn't end there, though. The program can also do a hidden line remov-

al, treating shapes as though they were really solid. Place one 3D rectangle partially over another and this routine will remove the parts of lines from the 'background' rectangle as though it were really covered - this can create stunning 3D effects not unlike *Knight Lore*.

A magnify feature allows every defined shape to be expanded or reduced in size and, as above, shapes can be treated recursively at different magnifications - allowing for the sense of things disappearing into the distance. All the designs can be incorporated into your own program; to cut this short let's just say that I can't think of anything I want to do with graphics that the program doesn't let me do.

**Program** Leonardo  
**Price** £14.95  
**Micro** Spectrum  
**Supplier** Creative Sparks  
296 Farnborough  
Road  
Farnborough  
Hampshire  
GU14 7NF

commands are summarised in a short two page booklet. It's a matter of changing heights, telling planes to circle and generally juggling 27 aircraft at once.

The graphics are good enough for something which essentially only requires blips and figures on a screen. The sound effects, curiously enough, are really extensive - more like an arcade zap-up than in intellectually demanding simulation.

## DEMANDING

At last some pieces of what might be loosely described as games software for the QL are starting to trickle through. *Area Radar Controller* is a simulation where you must play the part of an air traffic controller guiding planes in for safe landings and avoiding collisions.

The game is fairly complex to play properly although the

## AREA RADAR CONTROLLER

by **Adventure**  
for the **QL**



It's good if not staggering and is surprisingly cheap for a QL program, for that, at least, it deserves a glance or two.

### Program Area Radar

**Controller**  
**Price** £10.95  
**Micro** QL  
**Supplier** Shadow Soft  
70 Gooseacre  
Cheddington  
Nr Leighton  
Buckinghamshire  
B5 7QH

view from the cockpit window and the flight panel showing the state of various instruments: fuel, speed, horizon, altimeter, etc. The graphics are superb in large hi-res detail, and subscribers to the gosh-wow school of graphics should buy it immediately.

Nearly everything about the program is impressive, graphics, accuracy, playability (in terms of the combat sections), even the manual is good. There is a problem, though. The incredible degree of graphic detail has to be paid for in program run time. What this means is that when you are actually flying the plane, graphics like the horizon change in chunks instead of smooth scroll. The computer can't update the screen quick enough.

How much of a problem you find this is probably a matter of personal taste, I don't like it because I think it makes playing the game slower and more confusing than it really is. It's an excellent program but some simulation purists might object to some aspects of it.

## SIMULATION

*Spitfire 40* is the title of a flight simulation from Mirrorsoft. It's marked by superb, large graphics and an option to blast other aircraft from the sky at the same time as trying to fly the aircraft. It's not easy.

Flying the Spitfire means handling all the controls you'd expect. Throttle, rudder, flaps, undercarriage. The program also gives you a map showing the location of enemy aircraft in various levels of magnification.

There are three screen displays; the map of the area, a

### Program Spitfire

**Price** £9.95  
**Micro** Commodore 64  
**Supplier** Mirrorsoft  
Holborn Circus  
London EC1P 1DO

Compiled by Graham Taylor

*New Releases* is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: *New Releases*, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD

## This Week

**Activation**, 15 Harley House, Marylebone Road, London NW1 01 486 7588 **Adventure International**, 119 John Bright Street, Birmingham, B1 1BE, 021 643 5102 **Bubble Bus**, 87 High Street, Tonbridge, Kent TN9 1RX, 0732 355962 **Cable**, Cape House, 52 Limbury Road, Luton, Beds LU3 2PL, 0582 501493 **Creative Sparks**, Thompson House, 296 Farnborough Rd, Farnborough, Hants, 0252 543333 **Elite**, 55 Bradford Street, Walsall WS1 3GD, 0922 611215 **Evesham Micro**, Bridge Street, Evesham, Worcestershire WR11 4RY, 0386 49641 **High Voltage**, 16 Bridge Road, Park Gate, Hants, SO3 7AE **Kuma**, Kuma Computers, 12 Horseshoe Park, Pangbourne, RG8 7WY, 07357 4335 **Legend**, PO Box 435, Station Road, London E4 7LX, 01 524 8324 **Martech**, Martech House, Bay Terrace, Pavaneey Bay, East Sussex BN24 5EE, 0323 768456

**Meadow**, Hebrews Meadow, Lower Evington Road, Whitchurch, Hants RG28 7BY, 025682 2008 **Mirrorsoft**, Mirror Group, Holborn Circus, London EC1P 1DQ, 01 353 0246 **OEP**, Walton Street, Oxford, OX2 6DP, 0865 56767 **Posi-Tron**, 15 Central Precinct, Llanelli, Dyfed, SA15 1YF, 0554 759624 **Richard Shepherd**, Elm House, 23-25 Elmshott Lane, Cippenham, Slough Berkshire, 06286 63531 **Scorpio**, 307-313 Corn Exchange Building, Cathedral Street, Manchester 4, 061 834 2214 **Tatung**, Stafford Park 10, Telford, Shropshire, TF3 3AB, 0952 613111 **Tomorrow's Drm**, Richmond House, 18 Sydenham Road, Bristol, BS6 5SH, 0272 47860 **US Gold**, US Gold, Unit 10 The Parkway Ind Centre, Henlaze Street, Birmingham B7 4LY **Zircon**, 2 Wending Rd, Sutton, Surrey, 041 7102



"Got Them RS 232 Blues"

Got me some hardware  
Make your blue eyes sore  
Cost me a hundred headaches  
I got a need for more

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

Thought I'd write a program  
Thought I'd print it out  
Printer threw a wobbler  
Hand-writing is a chore

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

My publisher is funny  
Asks for the processed word  
So I've got this little cable  
Bit I leave it in the draw

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

The problem is the standard  
Which everyone ignores  
So I keep my soldering iron nice and hot  
and I'm always working on that chord

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

Did I say I have a modem  
I write on the bulletin boards  
Or I did until BT  
Said it was against the law

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

And all that work for nothing  
Sorting out the blasted cable

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

I've got about a ton  
Assorted books and mags  
I still can't get that cable  
To work with the help of them all

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

Just when I think I've sussed it  
Got the pins all figured out  
I pull the plug with the power on  
Just a moment's thoughtless action  
And the hardware's had it

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

I wouldn't really mind  
If the manuals weren't so awful  
At least then I'd have a chance of  
Making sense of what I saw

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

The software's just as bad you know  
It's written to confuse  
Those bugs are left to irritate  
Of this I am sure

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

But that's enough of idle chat  
I've got problems to sort out  
And then I've got some tests to run  
And it's nearly dawn

Don't talk to me now  
I got them RS 232 blues  
Got them RS 232 blues

Perhaps I wasn't hooked so bad  
I wouldn't get so unhappy  
but then, perhaps,  
I could try...

John R Cochrane

## Common logs

### Puzzle No 152

Eric was looking through a table of natural logarithms the other day when he noticed that the log of 178 actually contained those digits at the third, fourth and fifth decimal places: natural log 178 = 5.18178385. . .

After a lengthy search he found that this was the only three-digit number whose natural log 'contained itself' at the third to the fifth places of decimals.

Now, Eric is about to start exactly the same search for three-digit numbers, but this time using common logs. As before he is only interested in the third to fifth decimal places.

Can you save him from much hard work by finding the possible answers (if any)?

### Solution to Puzzle No 142

The initial number is 358846781, ending with the palindrome number 18181.

By taking the order of operations in reverse order, beginning with the palindrome, and ending with a nine-digit square, the program checks to determine if this square consists of the nine different digits, one to nine. The palindrome is generated in lines 10 to 80 of the program, and can only be in the range 11211 to 31431.

```

10 FOR A=1 TO 9
20 FOR B=9 TO 0
30 FOR C=9 TO 0
40 FOR D=9 TO 0
50 IF A*1000+B*100+C*10+D=18181 OR D=31431 THEN GOTO 190
60 LET S=NNNN
70 LET S=999999999
80 LET S=9999999999
90 LET C901=LET "1"
100 FOR F=1 TO 9
110 S=MVAL(MD2D(F,1))
120 LET G=MD2D(F,2)
130 NEXT F
140 IF G=45 AND T=362880 THEN PRINT N,S
150 NEXT C,B,A

```

To test for duplication of digits is done by evaluating the sum and product of the nine digits, a correct answer having a sum of 45 and a product of 362880. This is an adequate screening technique for most purposes and, as here, produces the only correct solution.

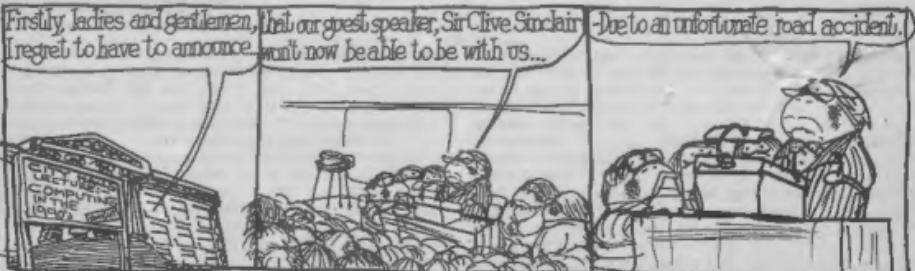
### Winner of Puzzle 142

The winner is P M Caborn of Moor Grange View, Leeds, South Yorkshire, who receives £10.

### Rules

The closing date for Puzzle No 162 is April 17.

## The Hackers



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1

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